Report of
The Maryland Agricultural Society—
Maryland Farm Bureau Federation,

INCLUDING REPORTS OF THE

Maryland State Horticultural Society,
Maryland Crop Improvement Association,
Maryland State Beekeepers' Association,
Maryland Vegetable Growers' Association,
Maryland Stockmen's Association,
Maryland Tobacco Growers' Association,
Home and Community Committee Meeting,
Maryland State Poultry Council
4-H Club Conference,
Roadside Marketing Conference

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REPORT OF THE

MARYLAND AGRICULTURAL SOCIETY

THE

MARYLAND FARM BUREAU FEDERATION

INCLUDING REPORTS OF

The Maryland State Horticultural Society
The Maryland Crop Improvement Association
The Maryland State Beekeepers' Association
The Maryland Vegetable Growers' Association
The Maryland Stockmen's Association
The Maryland Tobacco Growers' Association
Home and Community Committee Meeting
The State Poultry Council
4-H Club Conference
Roadside Marketing Conference

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BALTIMORE, MD.

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LETTER OF TRANSMITTAL

To His Excellency, Harry W. Nice,
Governor of Maryland.

Sir:

I herewith submit to you as directed by the Act incorporating the Maryland Agricultural Society, and also the Horticultural Society, this report for the year 1935, which contains a detailed statement of the receipts and expenditures of the Society as approved by the Executive Committee and Advisory Council. It contains the proceedings of the Twentieth Annual Meeting of the Maryland Agricultural Society, Maryland Farm Bureau Federation, and annual meetings of the Affiliated Associations.

I trust that an inspection of its contents will convince you that the funds appropriated for this purpose have been wisely and judiciously expended.

Respectfully submitted,

CHARLES E. WISE,
Secretary.

March, 1936,
Baltimore, Md.

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REPORT
OF THE
TWENTIETH ANNUAL MEETING
OF THE
Maryland Agricultural Society
Maryland Farm Bureau Federation

January 14-17, 1936
Lord Baltimore Hotel
Baltimore, Maryland

WEDNESDAY AFTERNOON, JANUARY 15

MR. FRED. JONES, President of the Harford County Farm Bureau, presiding.

Invocation by Reverend C. H. Lambdin.

MR. JONES: I count it a great honor to be asked to preside at this meeting, and I say that very sincerely. I count it an honor for a good many reasons,—one is that it is an honor to belong to an organization that can bring together an intelligent crowd of men and women, rural people such as we have here today. That is a fact. I count it an honor for other reasons, too. I have just been advised by our Secretary that the Maryland State Farm Bureau has increased in membership something over 30 per cent. since one year ago. That certainly speaks well for our organization, and it is an indication that people realize the value of this cooperative movement that is growing more and more all the time. It has come to stay.

When Mr. Wise asked me to take part, I asked him if I could have a little latitude and tell a joke or two. He said "No, we are sparring for time this afternoon." I told him that it was pretty hard for me to talk without telling a joke; that I thought my opinion sound. He said that was the trouble, my opinion was *sound* and that was all.

It has been my privilege to introduce our first speaker on a number of occasions. It is always a pleasure. I have the honor to present today as the first on our list, Mayor Jackson. Mayor Jackson has been Mayor of Baltimore City for a great many years. I presented him several times, but I never took more pleasure in my life in presenting him than I do this

afternoon, because he has demonstrated down through the years as a public servant that he is a friend to all the people, and he recognizes that the better friendship that exists between the rural people and the city people the better job he can do, and the best service he can render as the Mayor of this great city,—so I take great pride and have the honor of presenting to you the Mayor of this great city of Baltimore, the Honorable Howard W. Jackson.

MAYOR JACKSON: Mr. Chairman, ladies and gentlemen: I am very happy to greet you on this occasion. You know Fred. Jones talks very freely about the other fellow, he does not have to give an account to his wife when he goes back home. That reminds me of the fellow who was invited to a banquet and his wife admonished him to be very careful of his table manners. It was a little late when he got home that night so he did not disturb her, but the next morning she says "John, how did you make out?" "Well," he says "I only made one mistake and that was when they asked me to have some corn, I passed up my glass."

It is hardly necessary for me to extend to you a word of welcome on this occasion. You know you are welcome to Baltimore. You have great interest in Baltimore, and Baltimore has a great interest in you. I do not know how we could get along without each other, we are just one great, big family. That does not only apply to Maryland and Baltimore, the Counties of Maryland, that applies to this nation, and I think that is one of the things that has bordered more or less on the danger line in this depression. I tried to keep it down to the minimum in Baltimore,—a disposition on the part of certain people, the administrations in other Cities and States to only buy the things made at home, so to speak.—In other words, do not buy in Philadelphia those things that can be bought in Baltimore. Of course, I believe in home industry, I believe in boosting home industry, but if we are going to feel a prejudice and a selfishness towards things and people that live beyond or are made beyond the corporate limits of this State, or this city, that is not a good thing to do if we are going to preserve this Union as it should be preserved.

The thing that impressed me most in reading the caption of your program today was the fact that you are going to honor the F. F. A. boys,—the boys of the Future Farmers' Association, the hope of the organization. These boys are the future farmers, the future producers, the future consumers of this organization. That is what we are interested in, my friends, the future as well as the present.

If I were to say any more than just to welcome you here today it would be to remind you of this one thing,—and that is that we are suffering today a great deal from the burden which we are ourselves responsible for, but more particularly on account of the burden that has been handed down to us by our fathers, and our forefathers,—and I speak more particularly of the burden of taxation,—because our fathers, our forefathers

have left us much on which we can build with profit, and much of which we can be proud. There has been a disposition on the part of everyone, with little or no exception, in years gone by,—and some of it existing today,—of paying for it in the future, letting posterity pay for it. Now, my friends, when we build up a great debt with the idea that posterity will pay for it, and that was the idea in the past, it meant that your father and your grandfather, and my father and my grandfather left me that burden and left you that burden, and when we talk about letting posterity pay for this and for that, creating burdensome debt that we are only handing that tremendous burden to our children and our grandchildren. Do not misunderstand me, do not get the idea that I am not progressive, I am, at least I think so anyway, and I am for progress, but no community, no matter how small, and no matter how large can any more afford to do things beyond the ability of that community as a whole to pay for, than can an individual no matter how small or how large his position for financial resources might be in his community.

Who would ever have thought the great city of New York, of Chicago or other great cities would be in such financial stress that they would be unable to borrow money? But it happened. Why a few years ago back in 1916, or thereabouts, if anyone had mentioned to you the question of a liquidation of debt for a municipality like New York or Chicago you would almost have laughed in their face, and yet that is what has happened.

Therefore, I am glad on this occasion to welcome you to a city of approximately 900,000 people, approximately half the population of this State, that has always had a balanced budget. I say always, I speak more particularly during the depression, but we have always had it,—and a city that has reduced its outstanding bonded indebtedness in the last six years, a city that four years ago owed the banks on short term borrowings $175,000 borrowed money floating debt. We called it in, and a year later instead of owing anything, not even a penny, we had $12,000,000 in bank and we closed this fiscal year, December 31st, with a cash balance of $2,500,000. We discount our bills, we have not borrowed any money from the bank or anywhere else for the last three years. We reduced the taxable basis, the assessment on property, real estate and securities $495,000,000 lower than it was in 1931. We have reduced the tax rate every year with the exception of this year. This year it was increased $.16, and why? Because approximately one-half of that amount of increase, $800,000 in round figures, was made necessary to meet our debt obligation, to meet the obligation of money borrowed and spent in the past, and our debt service reached its peak this year, and if we do not spend faster than we pay off, from now on each year our debt obligation will get less.

We have to appropriate here in Baltimore,—it may sound small com-

pared with New York, Philadelphia, Chicago and other cities, but nevertheless it is big for us,—we have to appropriate $12,000,000 annually to meet our debt service, our bond and the interest on outstanding indebtedness $1.20 on your tax rate to start with,—our total tax rate $2.45,—net operating tax rate for the essentials of government $1.29. How can we keep it down in the future? My friends, the way I am going to do it in Baltimore,—and you can do it at your home, your community, no matter where it happens to be,—we are going to pay as we go, we are going to follow the pay-as-we-go policy that I established some years ago, that I tried to get so many years ago when I was a member of the City Council in 1908. From now on we are going to do at least one-third of our public improvements on the pay-as-we-go principle. We will have two classes, major and minor improvements. We could not build Baltimore City College on the pay-as-we-go principle. We opened bids for that this morning, the lowest bid was $1,429,000. We could not pay for that on a pay-as-you-go basis, that would mean approximately $.15 on our tax rate, but there is no reason why all of our elementary schools should not be built and paid for. We could not build Loch Raven, our water supply, on a pay-as-you-go basis, but there is no reason why our small water mains, our six inch water sewer should not be paid for. I could go on and draw those illustrations for you.

We have laid street pavements in Baltimore, the life of which was not more than fifteen years,—and they were laid under a forty-year bond issue, they were worn out twice before they were paid for. The first sewer loan we had in 1905 was made under a seventy-five year loan. It cost the city $10,000,000. How much interest do you think we will pay in seventy-five years? $26,000,000. That sewer that in 1905 cost us $10,000,000 will in 1980 have cost us $36,000,000.

Now why do I say that, why do I make this talk at this particular time? Because in my opinion, my friends, this nation is confronted with the most serious problem in its history, and I make no exception when I say the most serious problem in its history, and I could enumerate many things that enter into that problem, but the one thing that impresses me most is our social problem. You are not as conscious of it, and yet it affects you directly and indirectly as much as it does in great centers of population. Our social and unemployment problem is better in Baltimore; I will not attempt to go into that, Mr. Pouder will tell you all about that, but employment is better because we are taking thousands of people in Baltimore approximately 8,000, off of relief and putting them on W. P. A. public works, and that is estimated to last in Baltimore about fourteen to sixteen months. But unless you speed up business and unless you take the throttle off of business and let it go speed ahead what are you going to do with those people after that work is over? We are going back to what we call relief, and I respectfully submit that relief as it has been administered in the past is un-American, unsound economically, un-

fair to the man who receives it, and unjust to the man who pays for it in the way it has been paid for. Our social problem, however, must be met because it is our fault it is here. In other words, we have been a very smart people, we have made more advances than any nation in the history of the world, past or present, in a short space of time, compared with the old nations of the world; we have built a higher standard of living than any nation in the world, and yet in that advance and progress that we have made, we overlooked the fact that we were bringing on or developing or creating what life insurance people would call an "accrued liability,"—and may I take a moment more of your time to explain what I mean by an accrued liability and how it has happened? In the year 1840 the average life of a man was 39. I do not mean people did not live longer. They did. In fact, on Christmas Day I received a greeting card from a prominent man, and in addition to the sentiment he wrote this message,—"I am today ninety-five years, nine months and nine days old." He was living in 1840. But the average life of our people was thirty-nine years. By the advances we have made in medical science, sanitation and everything that contributes to the happiness of mankind we have increased the span of life from thirty-nine to sixty years approximately, yet the evolution in industry and the evolution in business, the introduction of machinery, new inventions have made practically unemployable the man for no reason of his own after he arrives between forty and fifty years. Industry makes him unemployable ten years below the average age that we have made it possible for him to live. That has created an accrued liability. We have a great number of people in this nation today physically fit for employment who can not get employment, and our obligation to them must be met, and I visualize for the future of this nation in the terms of dollars and cents, in the terms of buying and selling merchandise and farm products, in the exchange of goods in the exchange of dollars, I visualize for the future of this nation, I hope not in the far distance, the greatest period of prosperity that we have ever known, at the same time with the greatest number of our citizenship unemployed in our history.

I was talking to a man the other day. He had been employed by the Pennsylvania Railroad for many years,—I mean no disrespect to the Pennsylvania Railroad,—my father was with them for years. This man has lost his job on account of electrification. I asked him how long had he been with the Pennsylvania Railroad. I have a fellow feeling for a farmer and a railroader because I came from both, both maternally and paternally. He said he had been with them for eighteen years, but seniority had reached him. "How did you come to lose your job?" He said on account of electrification. I said "How many men lost their job at the same time for the same reason?" To the best of my recollection he said 132. I said to a man that came into my office about a year and a half ago,—he was greatly pleased because he had something to do with the installation of a piece of machinery in Sparrows Point that took the

place of 108 men,—"What are you going to do with the 108 men?" He says "That is not my job." It is the job of someone, and of everyone if we are going to continue to be a happy nation. The reason I mention that now is this. It is the most basic thing in the whole problem in order that we might be able to meet our obligation in every sense of the word. Connected with that is that subject of taxation, and we must realize that unless we can so arrange the taxes of our communities, our villages, our cities, our States and our nation that they may be within the ability of the people to pay, and also to set aside as the result of our labors sufficient in amount to meet our obligation to those less fortunate than ourselves, then we cannot remain a contented nation.

I hope you will understand that I did not come here to preach a sermon. We feel very close in Baltimore to the people in the Counties, our responsibility to them, our dependence upon them, we depend upon you for our fruits, and vegetables, although we do not get so many of them at this time of the year; it is to you folks more than anybody else that we give praise for the wonderful milk supply that we have in Baltimore that has enabled Baltimore City, in competition with other cities to receive the National award for two years in succession for the most progressive Health Department of any city in the United States. You folks in the Counties have made your contribution to that, and I just feel like one of you, I would leave that thought with you. Your happiness means our happiness and the happiness of the people of this City and State will make more certain the happiness of people throughout the Nation. I am happy to welcome you, and I am happy to greet you both officially and personally.

MR. JONES: Thank you very much, Mayor Jackson, that was a splendid address. I am sure it is very helpful to all of us. We are especially impressed with his report of his stewardship as to the finances of this great city. I could not help thinking while he was talking,—"Yes, Mayor Jackson, you have the right spirit. You come from Harford County." He said something about folks living longer. I heard a discussion about that between two men, one a married man and one a single man, as to who lived longest, and it was decided that the married man did not live longer, —it just seemed longer, that was all.

We will now have greetings from a representative of the Baltimore Chamber of Commerce, the Executive Vice-President, Mr. G. H. Pouder.

MR. POUDER: Mr. Chairman, ladies and gentlemen, it is always a pleasure for me to come here at your annual meetings and say a word of greetings to you in behalf of the business interests in Baltimore.

The Baltimore Association of Commerce has long recognized the importance of agriculture in Maryland's economic structure. Likewise, it has been fully appreciative of the extent to which farm income has contributed to the maintenance and expansion of Baltimore business. On account of this interest, the Association, in cooperation with the State Gov-

ernment of Maryland, conducted a short time ago a detailed survey of Maryland's agricultural industry which has been published and more or less widely distributed throughout the State.

This survey was prepared to convey a general economic picture of the more important phases of the industry—its development, present operations, potentialities, and economic value. It is hoped, also, that the study has proved a definite contribution of considerable value to the existing literature regarding the State, and has brought about a clearer understanding of some of the basic problems now confronting Maryland agriculture.

Even before undertaking the study just referred to, the Association of Commerce, as the principal representative of Baltimore business, cooperated with other interests on several previous occasions in an effort to advance the agricultural position of the State. For example, it was responsible for the organization of the "Live Stock Exhibition and Sale," which is held annually in Baltimore.

A knowledge of the agricultural industry of this great commonwealth is practically necessary for every business executive. This need is strongly emphasized by the widespread effect which the trends in farming activities have upon general business conditions throughout the State.

Products of the farm not only supply the most essential human needs, but they also serve as a stimulus to the development and maintenance of other forms of economic enterprise, such as manufacturing, trade, transportation, et cetera.

I wish to take this occasion to congratulate the farm leaders of Maryland in the splendid work they have done in the past in advancing the State's agricultural industry, and to extend to them the cooperation of the Baltimore Association of Commerce in their efforts to further develop Maryland's greatest and most important basic industry.

MR. JONES: Thank you very much, Mr. Pouder.

We will have some announcements now. (Announcements given).

Next on the program is the President's annual address. Mr. Nuttle comes from Caroline County over along the shore of the old Chesapeake. He was telling me a little story the other day about a little darky fishing, —had a little piece of meat tied to a line, and a huge fish caught it up and struck out across the Chesapeake; he yanked the little darky down into the water and he had a lot of trouble; finally he succeeded in getting back on the bank and he says "Look here, what I want to know is this here nigger fishing or is that ole fish a-niggering."

We are glad now to hear from the President of the Maryland Farm Bureau, Mr. H. H. Nuttle.

MR. NUTTLE: I feel that the first thing I should say would be a tribute to Mr. Charles T. Cockey, Jr. He felt that he should resign, and I as the fifth wheel of the organization,—the vice-president, of course, took over. There is no man in the State of Maryland who has more interest in the welfare of the farmers, the agricultural community of the State of Maryland, than Charles T. Cockey. He gave untiringly of his time and interest, his heart is still wrapped up in our organization. It gives me pleasure to pay him this tribute.

PRESIDENT'S ADDRESS—1936

The 1936 annual meeting of the Maryland Farm Bureau Federation—the 20th in its existence—comes at an exceedingly critical period in the history, not only of the Farm Bureau, but of the nation's agriculture. With the help of the A.A.A. and drought conditions we have come part way up from the period of lowest agricultural prices and income. We are faced now with the problem of holding the gains we have made, and moving still further toward agricultural parity, without which farmers cannot hold their place with other classes of people.

A tremendous responsibility rests upon us as farm leaders. The future of all agriculture, depends upon how we, as leaders of organized farmers of Maryland meet the challenge of the times, and cooperate with leaders of other sections in the development of our national agricultural program.

We have, of course, a selfish interest in agriculture's position. We are anxious that this generation and future generations of farmers shall be on a parity with other industries that we may keep a balance in our economic and social condition. We cannot sit supinely down with industry enjoying the protection of tariff walls while we must sell our products at prices based on world markets in competition with peasant labor and starvation wages. We cannot go through another period like 1921-33 trying to pay our bills on the principle that the lower prices are the more we must produce, while at the same time industry maintains prices, restricts its output, and ploughs millions of workers out into the streets to swell the army of the unemployed. You say, "They work together," "They work as a group." So they do, and so must we for in our present complicated economic structure our only hope of economic parity lies in group action. What can you as an individual do to lessen the unfair load of taxation that real property now pays? What can you as an individual do to hold down the wheat speculators of Chicago, fight the exorbitant prices of tin cans, or even argue with the Commission Merchants of Baltimore, when they raise their charges from 5 to 8 per cent. We must work together, we must organize, for only in that way can we secure and maintain an improved economic and social life for the farms of America.

While thinking of the welfare of our own industry, it is well to look at the position of agriculture from a still broader angle. Because of the

basic position of our industry, national welfare is dependent upon our condition. In his talk at the recent annual meeting of the American Farm Bureau Federation, General R. E. Wood of Sears-Roebuck pointed out this dependence in an unusually striking manner. Gross farm income, he said, dropped from $12,000,000,000 in 1929 to $5,200,000,000 in 1932. Wages paid by manufacturers almost exactly paralleled these figures, dropping from $11,600,000,000 in 1929 to $5,022,000,000 in 1932.

The start of recovery came only with the increase of farm buying power, and has been following it since the upturn. Here is another quotation from General Wood, "If I read my history rightly, no urban civilization has perpetuated itself. If our American state is to endure, we need the stability, sound thinking and patriotism of the 6,000,000 American farmers. If they become impoverished, our social order will indeed be threatened." We in Maryland have a responsibility even beyond our personal interest in farm income because of this situation. Here in the industrial East, many industrial and financial leaders do not even recognize this dependence of the nation's welfare on agriculture. We have the opportunity of pointing it out to them.

Speaking generally, our program for the Farm Bureau organization in 1936 can be grouped under two general headings. First, we must work with agricultural leaders in all parts of the country in the establishment of some method of replacing the A.A.A. There is the immediate need of securing justice to those who have already contracted to enter control programs, and the even more important problem of a permanent adjustment program on which agricultural parity depends.

The second phase of our program should deal with the development of a permanent structure to guarantee agriculture a greater degree of economic security. This can be built through cooperative business organizations. Cooperatives are slow in growth and we must be patient in this development. There is, however, a greater possibility in this direction than we have thought of in the past. While appreciating the aid of Government agencies, we must recognize that they are subject to political partisanship, court decisions, changes in administration, and other uncertainties. A long-time program of cooperative development of our agencies for marketing, purchasing, and finance, will make us less and less dependent upon temporary expedients, or agencies outside of agriculture itself.

In Northern Europe, through cooperatives, the producer is getting 20 cents more of the consumer's dollar than we are here in the United States. If we had that extra 20 cents, our farm problem would not be acute.

We in Maryland have far to go to reach such a goal. But you have laid the foundation of cooperative effort through the years. Now, we must build on those foundations.

Your officers in the past year have been in touch with Farm Bureau developments in Ohio, Illinois, Pennsylvania, Vermont, and New Hampshire. We can profit from some of the experiences of those States but we will have to adapt their methods to our own conditions. In thinking along these lines we feel we are particularly fortunate in being able to secure Art Weed for Maryland after 13 years of outstanding service in Ohio. With Ed Wise, Art Weed, Bill Evans to lead us we can go far. Furthermore, the increase in our membership in the past year indicates the interest of our farmers in such a program. There was never a time when organization was more greatly needed, nor our opportunities and responsibilities more apparent. This, as I see it, is the challenge that faces us as we meet to consider the past and plan for the future. Our Secretary, Mr. Wise, will give you some further suggestions along this line.

MR. JONES: Thank you very much, President Nuttle, you surely covered a big question in a very big way. Personally, I feel like this troublous period through which we seem to be passing at this time is all for our own good and eventually good is going to come out of it. It is all for the best. I like to think along those lines, and that eventually we will come to ourselves like the old colored man. He was so discouraged, so disgusted with himself that when he went out to feed the pigs he took off his coat and threw it to the pigs, then he took off his vest and threw it to the pigs, he took off his suspenders and threw them to the pigs, and then he come to himself.

Next on the program is the report of the Secretary of our State organization, Mr. C. E. Wise, Jr. Mr. Wise has been our Secretary for several years. He will now give an account of his stewardship up to this time. Mr. Wise.

Mr. Wise thereupon read the following address:

SECRETARY'S ANNUAL REPORT—1936

By C. E. WISE, JR.

The year of 1936 calls for definite and aggressive action by all of us if we are to continue the splendid progress made in 1935. This progress resulted from the hard work and the cooperation rendered by county leaders and extension workers. I hope that you all have enjoyed this work as much as I have and that you look forward to 1936 with as much anticipation as I do. In no other position have I found the pleasure that I have had in working with the Maryland Farm Bureau leaders and members.

We have made progress in 1935 and today, as we plan for the future, it is best to look back over the past year to see how far we have come. With the knowledge and the experience that we have gained in attaining these accomplishments we can lay the foundation for greater progress in 1936.

There is strength in numbers and our organization has developed more power by an increase of 36 per cent. in the nation and 45 per cent. in the State membership. A new spirit has been instilled into the membership, a spirit that has led to improvement all along the line, from legislation to cooperation.

In face of increased competition, the Agricultural Corporation has made a record much better than that of the previous year and is now making gains in each succeeding month. Another encouraging feature is a net gain of 2,000 policies by the Farm Bureau Automobile Insurance Company.

Our three marketing cooperatives have increased the volume of products handled, and improved the service rendered with the exception of the Wood Pool. The volume declined in the 1935 pool because of delayed payments and a loss of 5 cents per pound on the wool in 1934. This loss was caused by a falling market after the Pool was made but before the wool was sold. The 1935 Pool netted the grower 3 cents over local prices, thereby making a net increase of 11 cents per pound to those who marketed wool in the year 1933-34 and 1935. This is a typical example of cooperative marketing and proves that the consistent or loyal cooperator gains over a period of years. The inconsistent supporter, often called the in and out cooperator, invariably picks the wrong year to sell through the Pool. Maryland farmers are fast learning this fundamental of cooperation, that the benefits of cooperation come to those who cooperate.

A special effort was made to assist our grain and livestock marketing cooperatives. The program, while not extensive resulted in an increase of over 20 per cent. in the volume of Maryland grain marketed by members through the Farmers' National Grain Marketing Corporation. Equal results were secured for the Eastern Livestock Marketing Association.

Their books show a 100 per cent. increase in cattle marketed cooperatively.

These are our own marketing agencies, they are farmer-owned and farmer-controlled, and when they receive the support they justly deserve the benefits will surpass those derived from legislation. Furthermore, these benefits cannot be taken from us by a court decision. We must not minimize what constructive legislation will accomplish in the way of protecting our interests and lowering our taxes, but the limitations, and uncertainties of legislation are apparent to all. Laws create the economic habitat or atmosphere in which our bnsiness plant lives. The final success of this plant depends on how we take advantage of the opportunity and not on the law itself. When we depend on law for more than general help, we are on very treacherous ground as was recently demonstrated by the Supreme Court decision that wiped out the adjustment program.

A cessation of watchfulness on our part might result in the same thing happening to other measures—the farm-to-market road program, the rural electrification program, or the reduction of interest rate to 3½ per cent. We, as an organization, must ever be on the alert. And now our major national project must be the building of a new program that will assure agriculture benefits equal to those offered by the three A's. Organization's job is never done.

Legislation in Maryland is in a like position, as the accomplishments in 1935 may be our losses in 1936, if they are not vigorously supported. The last legislature passed several bills beneficial to agriculture. Your representative kept in constant touch with the progress of 100 bills related to agriculture, selected, after reading the 1200 bills introduced. The Farm Bureau fought and helped defeat the diversion of $4,000,000 of gas tax revenue to the general budget. We were not so successful, however, in securing a restoration of the $18,000 cut in the appropriation for the Extension Service. Neither did we have sufficient strength to put over our complete tax program although it did pass the Senate only to be defeated in the House. The inheritance tax on direct heirs long advocated by us, passed and is now in effect. The Farm Bureau cooperating with other organizations stopped the 2 per cent. retail sales tax but was unable to prevent the passage of the 1 per cent. gross receipts tax. The principal of this tax is bad as it is a 1 per cent. levy on gross sales regardless of the profit.

Several other acts beneficial to farmers were sponsored and passed. Among these was the re-enactment of the law providing for the allocation of the 1½ per cent. gas tax revenue to the counties. In the original budget $500,000 was diverted from the county funds but strong opposition by farm organizations secured the restoration of this money to the counties. Other important acts, sponsored and passed, include the fresh egg law; the law that prohibits the sale of inedible eggs; a law to permit cooperatives to borrow on rotating stocks of goods; a law that requires milk

dealers to secure permits and provides also for the proper testing and sampling of milk. A more complete legislative statement will be included in my printed report.

The foregoing program on membership, cooperation, and legislation were conducted during most of 1935 by county and State leaders and the State secretary. Early in the year, your secretary realized that it was necessary to expand the service and information rendered to members. When the plans for this were presented to the Executive Committee, they were approved. Martin Sutton was employed as organization director and Arthur Weed as director of information and programs. These moves were made to improve the machinery to carry out a well-rounded program. Our staff is now complete and ready to serve a membership of over 10,000.

Our income has kept pace with the expenses and our statement for the year shows a surplus of receipts over expenses amounting to $1200. The budget for 1936, based on only 4,000 members and a 15 per cent. increase in insurance income, is balanced.

Over 4,000 years ago, a Chinese philosopher said "A 5,000 mile journey is started by a single step." In other words, when you begin a journey you decide first where you are going and then how. Each step leads nearer to the desired goal—we have come many steps this last year and are well prepared to continue on during 1936. We know both the where and the how.

This year, I believe, we should make a more definite statement of our purposes and program than ever before. At the earliest possible meeting of your Board of Directors I expect to recommend for adoption, a definite program, with goals for your State organization and county Farm Bureaus. This program should, in the main be centered around the following:

In membership—that we set a State quota of 5,000 and proportionate quotas for the counties, and that we start two additional county Farm Bureaus.

In organization—that we have a program and scheduled meetings and secure at least 12 working leaders in every organized county.

In cooperative purchasing—that we develop an understanding of, and a loyalty to cooperative purchasing in all members. In doing this, that we instill an increased sense of ownership in the Agricultural Corporation of Maryland in all individuals and county Farm Bureaus to the end that their purchases be made through the Corporation. As a definite goal, the organization of two more county Farm Bureau Cooperatives.

In cooperative marketing—that we develop the service and volume for all existing affiliated cooperative marketing associations and inform all members of the opportunities these agencies afford. Let us determine that

during 1936 we will double the volume of grain handled by the Farmers' National in Maryland, double the volume of livestock handled through the Eastern Livestock Marketing Association, increase the efficiency and volume of the Wool Pool, and assist the State cooperatives which market tobacco, milk and other products.

In our general legislative program—that we determine to instill a sense of duty in our representatives to work for the best interests of the State and demand that the tactics of ward healers be replaced with straightforward legislation. Let statesmanship be returned to our legislative halls at Annapolis.

That we work continually to curtail normal governmental and relief costs to the end that a reduction in the real estate tax may be secured. Let our goal be an efficiency and economy committee in every county.

If a special session of the Legislature is called, that we work for the adoption of our tax program for 1936 with emphasis on the passage of an income tax law.

That we prepare and pass legislation on specific problems, such as a bill to license cattle dealers and which provides for severe penalties for misrepresentation or fraud on the part of these dealers; another bill, to require all canners to be bonded, so as to insure the payments for the farmers' products, and that we prepare bills on other necessary legislation of benefit to agriculture.

That we support appropriations for the University of Maryland; additional funds to fight the Japanese Beetle, funds to enforce and administer the fresh egg law and sufficient funds to continue and expand the Bang's Disease eradication program in Maryland.

In our general program—let our objective be that we continue the development of rural electrification and farm-to-market roads. That we inaugurate a study of cooperative finance and possibly organize two credit unions as a start of a finance program.

In our educational program—let our purpose be to develop a program of information and education to strengthen the cooperative organization of Maryland farmers.

Further, that we study cooperation and farm management. Our goal will be at least one cooperative study group and one farm management club per county and a full time extension specialist available for the farm management project. "Farm management is the application of business principles and the scientific principles of agriculture to the business of farming." It teaches how to increase net profits by better use of the materials at hand. It brings out better soil conservation practices, better planning and gives an insight into our production costs. The knowledge and the practice of these principles leads to greater net incomes on equal

or smaller volume of business or production. It will point to the production and use of home grown feeds, cropping practices to maintain soil fertility with less outlay for fretilizer, more efficient use of labor. Maryland farmers spend around $12,000,000 each year for feeds and for fertilizer. Here is an opportunity for a saving equal to direct benefits paid under control programs.

Better farm management is fundamental to a better national agriculture. A study of its principles and practices are of paramount importance to the success of any sound national program.

My final recommendation is that when a new national plan is adopted we give it our full support and assist in every way to speed its operation in Maryland.

The program recommended to you is a broad one; its wide scope is necessary to meet the varying needs of Maryland agriculture. Our county programs built from it, should be definite. There is danger in spreading ourselves over too much territory, so let us concentrate in the counties and in each county pick a major project and a few minor ones. The way to accomplish anything is to do one job at a time and do it thoroughly. Let the theme of our program be to lower costs, by tax reduction, by cooperative purchasing of needed supplies, by the use of more home-grown feeds and to reduce fertilizer needs through lime, legumes and livestock and to increase our net income by cooperative marketing and a stable price structure.

Economic conditions are favorable for our program now and every indication points to a continued improvement providing some plan is adopted to replace the adjustment program. Agricultural income has increased progressively for the past three years and this improvement is reflected in wide-spread gains. From 1929 to date, agriculture has suffered a deficiency of twenty-five billion dollars in purchasing power. The trend is now upward, having started at 5½ billion in 1932 and reached 8 billion in 1935 but this is only two-thirds of its normal income of 12 billion.

Here is a picture of the situation. There are 30 million people on farms; they contribute over one-sixth of the nation's capital, one-quarter of its gainfully employed labor, but in 1934 received only one-eleventh of the national income. This inequality was gradually being corrected by a program that provided measures to secure a stable price through the adjustment of production to consumption and price differentials on the crops specified. For the first time in our history, farmers had a program for parity with other industries but this has been thrown out of court and agriculture's fate hangs in the balance.

Economic disaster equal to 1929 faces this nation if a substitute is not made operative immediately to hold the gains made, and insure further progress. This situation faces our nation, a nation plentifully endowed

with ability to produce and the need to consume. We have learned to produce, but we have failed to learn how to distribute our products. There is a way out and failure to follow it will be a reflection on the statesmanship of our country.

Our State program will go a long way toward solving these problems at home. Nationally we have to fight the so-called entrenched interests—interests that have contested our every advance. They are the ones who instigated and won the recent court decision against the adjustment program. A very short-sighted policy on their part, for without a program, farmers would have no money to spend for commercial products. Industry stands to lose more than agriculture by this decision.

The old program was not perfect. It contained many inequalities and was becoming more complex each day as new crops, new forms, and new regulations were added to the maze of red tape. At best, it was only a temporary measures to fill the gap while a permanent program was formulated. Indications are that this permanent was to be based on soil conservation and a plan that would permit the application of farm management to the individual farm. The Farm Bureau offered a similar plan to the farmers' conference in Washington. According to reports, this is the plan now favored by the conference members and governmental officials.

The main features are soil conservation, the adjustment of crop acreage and volume by land rental, the use of general funds, revenue to promote the sale of livestock products, retention of the valid sections of the old act and the sale of all farm products, held by government agencies, through cooperative marketing associations. This program would allow farmers to manage their own farms; it would correct former inequalities to sections and to producers not helped and often injured by the old program; it would assist cooperative marketing and most of all it would encourage sound farming by stimulating soil conservation. When the final decision is made as to the program, we must be ready.

We are preparing to combat powerful groups and it is our duty to arouse the strength of our organization to meet the issue. Let us accept this task—adopt a program better than the old—and become the masters of our own destiny.

MR. JONES: Thank you, Mr. Wise. We feel again once more that you are very well named.

We will now have the report of the Auditing Committee. Mr. McDowell, Chairman.

The Auditing Committee's report was thereupon read, and duly approved.

AUDIT COMMITTEE

The auditing committee appointed by the president to examine the annual audit of the Treasurer submits the following report:

The books and accounts of the Maryland Farm Bureau Federation have been audited by a certified public accountant, and your committee has examined the audit as prepared. This report will be printed in full in the annual report and a copy forwarded to each county for the information of all members.

It has always been the policy of the Farm Bureau to spend available funds for service to members; however, it is gratifying to report that the State organization has added $1,239.22 to its assets during 1935.

All obligations have been paid up to and including December 31st, 1935.

Respectfully submitted,

P. C. TURNER,
JOHN S. BUSHEY,
R. E. SHOCKLEY,
DAVID B. McDOWELL, Chairman.

Schedule 1

Statement of Receipts and Disbursements for Period from January 1, 1935, to December 31, 1935

RECEIPTS

County Dues Collected	$4,130.00	
A. F. B. F. Dues Collected	1,652.00	
Co-op Subscriptions Collected	826.00	
Associated Membership Dues Collected	180.00	
Farm Bureau Organization Expense Refund	386.86	
Publicity Income	232.60	
Bonding Expense Refund	50.00	
Annual Meeting Expense 1935 Income	622.50	
Office Expense Refund	13.51	
Rent Telephone and Telegraph Refund	1,240.00	
Committee Expense Refund	20.80	
Auto Insurance Commissions Income	3,162.59	
Auto Insurance Renewals Income	11,870.50	
Interest on U. S. Treasury Bonds Income	60.00	
Interest earned Income added to Saving Account	84.60	
Furniture and Fixtures, Sale of Chair	2.00	
Automobile Expense Refund	5.00	
T. Fair Expense Ticket Sale	103.65	
Total Receipts	$24,558.01	
Bank Balance January 1, 1935	5,167.73	
Available Cash		$29,725.74

DISBURSEMENTS

Farm Bureau Organization Expense	$1,430.23	
Board of Directors Expense	790.70	
Publicity	957.58	
Salary President	1,250.00	
Salary Secretary and Treasurer	3,750.00	
Salary Information Director	250.00	
Salary Organization Director	600.00	
Salary Clerks	2,787.00	
Salary Accountant	180.00	
A. F. B. F. Dues	1,685.50	
Bonding Expense	80.00	
T. Fair Expense	178.10	
Annual Meeting Expense 1935	1,259.88	
Office Expense	1,197.43	
Automobile Expense Secretary and Treasurer	549.79	
Federal Check Tax	1.30	
Rent Telephone and Telegraph	2,197.17	
Traveling Expense President	33.25	
Traveling Expense Secretary and Treasurer	401.95	
Traveling Expense Information Director	69.05	
Traveling Expense Organization Director	166.38	
Automobile Expense Organization Director	86.50	
Committee Expense	1,048.74	
Distribution of Auto Insurance Commissions	75.64	
Distribution of Auto Insurance Renewals	1,486.61	
Annual Meeting Expense 1936	11.25	
National Convention Expense	749.72	
Wool Pool Expense	1.16	
Taxes	99.74	
Educational Expense	62.18	
Legislative Expense	25.00	
Total Expense Disbursement	$23,461.85	
Investment Disbursement (Agri. Corp. Note)	2,000.00	
Total Disbursements		$25,461.85
Equitable Trust Company Balance Dec. 31, 1935		$4,263.89

Schedule 2

Statement of Receipts and Disbursements for Month of December, 1935

RECEIPTS

County Dues Collected	$291.25	
A. F. B. F. Dues Collected	116.50	
Co-op Subscriptions Collected	58.25	
Associated Membership Dues Collected	20.00	
Rent Telephone and Telegraph Refund	103.33	
Auto Insurance Commissions Income	272.54	
Auto Insurance Renewals Income	982.50	
Farm Bureau Organization Expense Refund	54.42	
Publicity Income	9.75	
Interest U. S. Treasury Bonds Income	30.00	
Total Receipts	$1,938.54	
Bank Balance December 1, 1935	4,939.79	
Available Cash		$6,878.33

DISBURSEMENTS

Office Salary President	$100.00	
Office Salary Secretary and Treasurer	300.00	
Office Salary Clerks	188.00	
Office Salary Organization Director	150.00	
Office Salary Information Director	250.00	
Office Salary Accountant	10.00	
Office Expense	115.44	
Rent Telephone and Telegraph	195.82	
Traveling Expense Secretary and Treasurer	43.00	
Traveling Expense Organization Director	33.88	
A. F. B. F. Dues	1.50	
Farm Bureau Organization Expense	220.06	
Automobile Expense Secretary and Treasurer	40.76	
Automobile Expense Organization Director	11.81	
Committee Expense	125.79	
Tax Expense	26.03	
Publicity	71.69	
National Convention Expense	574.72	
Distribution of Auto Insurance Commissions	75.64	
Annual Meeting Expense 1936	11.25	
Traveling Expense Information Director	69.05	
Total Disbursements		$2,614.44
Equitable Trust Company Balance Dec. 31, 1935		$4,263.89

SCHEDULE 3

Statement of Assets, as at December 31, 1935

LIQUID

Cash in Equitable Trust Company, Active Account	$4,263.89	
Cash in Union Trust Company, Checking Account	524.66	
Cash in Equitable Trust Company, Saving Account	4,084.60	
Union Trust Company, Certificate of Beneficial Interest (in Safe Deposit Box)	349.24	
U. S. Treasury Bonds, 3 (in Safe Deposit Box)	1,960.00	
Accounts Receivable as per office record	902.91	
Live Stock Association Note (in Office Safe)	2,054.00	
Agricultural Corp. Note (in Office Safe)	2,000.00	
Total Liquid Assets		$16,139.30

FIXED

Furniture and Fixtures	$3,021.86		
Less Depreciation Reserve	2,281.72		
Net Book Value		$740.14	
Automobile	$725.59		
Less Depreciation Reserve	425.09		
Net Book Value		300.50	
Total Fixed .Assets			1,040.64
Total Assets			$17,179.94

Analysis of Accounts Receivable as to Age:		
Accounts on books longer than six months	$501.59	
Accounts on books less than six months	401.32	
Total Accounts Receivable		$902.91

MR. JONES: One of the real problems that we have to face is the education of our young folks. We have in Maryland an institution that we call the University of Maryland. It has been performing the job of educating our young folks, and we are fortunate today in having with us the Acting President of that Institution, Mr. H. C. Byrd.

MR. BYRD: I asked Dr. Symons what I should talk about and he said "Don't say anything to make anybody mad."

ADDRESS BY ACTING PRESIDENT H. C. BYRD OF THE UNIVERSITY OF MARYLAND

Maryland's agriculture is older than that of any State in the Union with the exception of one or two of the original colonies. It has been through many economic depressions. There was a time in the 1820's and 1830's when the business of farming was at such a low ebb that on the large plantations it was virtually impossible to feed the slaves. But despite its long history, Maryland agriculture, in my opinion, is just in its infancy.

In the early part of the 19th Century there were great migrations from Maryland to the Western plains in search of new and more fertile lands—as many as five thousand Marylanders passing through a West Virginia town in a single week. However, it was only recently that a representative of a great Western agricultural organization, on a visit to Maryland, said that he believed the next great movement in agriculture was going to be from the West to the East, that in Maryland are untold opportunities.

The wide diversity of Maryland agriculture gives it a tremendous advantage, while proximity to some of the greatest markets of the world offers a security and opportunity for development that few other States possess. Agricultural products in Maryland range from tropical figs to beef cattle, and from maple syrup to cabbages. It is interesting, also, to contrast the average annual value of the corn yield per acre in Maryland, which is $24, to $18 for Indiana, $20 for Illinois, and $21 for Ohio.

Maryland is not supposed to compare in the least with the great wheat States of the Middle West, and yet the wheat grown in Maryland has an average value per acre of $19 against $11 for that grown in Kansas, $16 for that grown in Iowa, $14 for that grown in Minnesota and $13 for that grown in Nebraska.

It is further interesting, to note that the annual crop value per acre in Maryland is $32.52 or 66 per cent. of the average capital investment per acre, against the next highest of 57 per cent. for Pennsylvania, 50 per cent. for New York, 38 per cent. for Oklahoma, 28 per cent. for Missouri, 23 per cent. for Indiana, and 21 per cent. for Kansas.

I mention these pertinent facts only to show that even for those products through which the big Middle Western States established their stand-

ing as great agricultural regions, they do not equal Maryland, when it comes to value in per unit production.

But what of it? What advantage do we expect to take of our opportunies? What is to be our program?

We of this State believe in national planning. It seems to us that there can be no adequate national prosperity unless each section of the nation is willing to play its part in the national set-up. However, what we as Marylanders are especially interested in are our own immediate problems. We would not be human were this not true. What we want to know is what we can do best to conserve our resources and at the same time provide adequately for the present.

I believe the farmers of this nation are opposed to the expenditure of tremendous sums for reclamation of lands for agricultural purposes. However, if this policy is to continue, certainly it would be appropriate and less expensive to reclaim through drainage more of the fertile low lands of the Eastern Shore and of Southern Maryland which are close to the great markets of the East. We know, for instance, that when the Pacific Northwest had a large surplus of soft wheat, that surplus was shipped into Maryland and caused a lowering of the price of the particular kind of wheat which Maryland grows best, but what we should find out is what to do about this if the same condition again presents itself. Apples from the Pacific Northwest are in competition with Maryland-grown apples, and recently a representative of one of the agricultural organizations of the New England States told me that the fruit growers of those States are going to make a tremendous drive this Winter and next Spring to take away from Maryland people the big Boston market. We must find how to protect ourselves from this competition.

If national planning gives us this protection, all right; but, as I see these problems, I strongly suspect it will be incumbent upon us, ourselves, to find a way by which they can be satisfactorily met. These problems are just simple indications of the great necessity for real leadership.

For several days we have been hearing a good deal of criticism of the Supreme Court because of its decision invalidating the A.A.A. program. But, to my mind, it is not worth while to waste time in such criticisms for the simple reason that such criticisms can do no practical good, even if there were reason to criticize a body for doing its duty in interpreting the Constitution. Let us forget the past, except that part of it which we can utilize for future constructive effort, and put our minds to thinking out another and legal way to achieve results just as beneficial.

However, the Constitution itself is not sacrosanct and we must grant each succeeding generation an inalienable right to make such changes in it as each generation feels to be needed. So, if we determine that the Constitution should be changed in order that Government may make ef-

fective such laws as may seem necessary to meet the needs of the people, then let us effect such changes, but let us not be turned generally against the instrument which is the greatest guarantee of civil rights and personal liberties under which any people has ever lived.

All of us know the essence of the agricultural problem. We have heard it often. It narrows down to the simple thesis that the farmer should get a larger share of the ultimate profit on what he produces. But how to effect this is difficult indeed. In the simplest explanation possible, this is exactly what the A.A.A. organization was set up to achieve. The farmer produced a commodity, it went to the mill, a processing tax was placed on it, which tax was passed on to the ultimate consumer, and thence back to the farmer in benefit payments. In other words, a cotton planter in Georgia might send cotton to Baltimore to be made into a shirt. The processing tax would be placed on it and the shirt sent to Nebraska to be sold to the ultimate consumer at a cost of 3 to 4 cents more than if there had been no processing tax, and this 3 or 4 cents then would go back to the grower in Georgia in benefit payments.

But the Supreme Court says that general taxes cannot be levied for the special benefit of a class, and it devolves on us to find another way, and that way may be found through lessons learned under the A.A.A. organization.

Entirely aside from the financial benefits derived by the farmers under the A.A.A., it seems to me that the greatest lasting value from it is the example of the worth of cooperation on a nation-wide scale, and in my opinion, it is in cooperative effort that we shall find the key. Great commodity cooperatives organized to cover the whole country, with complete control through local units, would seem to be a possible solution, but entail unusual difficulties.

A commodity cooperative, like the citrus cooperatives of California or Florida, because of the limited geographical scope of their production, presents simple problems as compared with a commodity cooperative association organized to control wheat production and marketing, grown, as wheat is, in almost every corner of every county in every State. However, if all Government agencies were to lend assistance as they did in organizing the system of benefit payments under the A.A.A., I believe the farmers of the nation would be able to do for themselves, through their own cooperative efforts, everything that the Government could do for them by control.

Another lasting value that has come out of this depression is that Industry, the Professions, business of all kinds, have had impressed upon them the absolute need to maintain the buying power of the farm population, to keep this basic industry of agriculture in a profitable condition. Our lawyers and doctors and merchants and bankers are learning that,

when two hundred thousand members of farm families in Maryland have their direct income increased by more than $2,000,000 through a more equitable division of ultimate profits, this money does not stay in the country, but finds its way to the towns and cities and helps to give people work, because it purchases the commodities that towns and cities make and sell.

Of course, the argument may be made that this tends to raise the price of food to the consumers in the cities and towns. And it is true that for a brief while a depression in agriculture may give the city worker farm products at lower prices. However, this can continue to the point, as it did recently, where the farmer has little purchasing power and virtually no credit, and at this point the market for the goods made by the city worker begins to disappear; the factory has no outlet for what it manufactures, consequently no income; production is curtailed or perhaps discontinued altogether, and the city worker finds himself without a job and without money to purchase food, no matter how low the cost.

In presenting such alleged arguments to the city worker about the low cost of food, the demagogue makes himself the worst enemy the city worker has and may eventually cause him to suffer greatly by comparison, because without income the city worker does not eat except by charity, while the farmer always can grow sufficient food for his own needs and those of his family.

The last five years have impressed on the people of the cities and towns, as no other time has, that there cannot be sound prosperity in other lines of industry in the cities, nor in the country as a whole, when the basic industry is in serious difficulty.

The goals around which center prosperity for agriculture may be summed up in three basic premises:

(1) Efficient production.

(2) Control of production.

(3) Control of marketing.

The depression period unquestionably has caused the farmer to do a good deal of constructive thinking, and has caused him to begin to study more carefully ways and means of producing at the least possible cost to himself. In the other two, however, we have only scratched the surface, and the task of meeting the issues involved in the control of production and control of marketing is one that will tax the best minds of the nation and also require the highest degree of cooperative effort on the part of the farmers themselves.

Personally, I have an abiding faith that no matter how difficult may be the way that lies before us, those of our leaders most responsible for the real constructive work in agriculture—men in the State like Harry

Nuttle, Roy Brookes, Ed Wise, Dr. Symons and others—men in the Nation like Ed. O'Neal, and Chester Gray will, with your help, find a way that will give to you a just part of the fruits of your labor. But for these men to be successful, for them to achieve for you the goal you desire, you must remember that it is only through intelligently directed farm organizations that they can ever hope to obtain the expressions of opinion and the facts that will enable them to formulate wise policies.

The Maryland Farm Bureau and the Maryland State Grange have a wonderful record of achievement, but both must tremendously increase their membership if they are to exercise the influence that they should.

No man can over-estimate the tremendous responsibility that the farm leaders now have on their shoulders. They have just completed perhaps the best job that ever has been done in this State in carrying out recent policies and programs initiated by the Federal Government. And in this connection I should like especially to congratulate Mr. Davis upon the splendid manner in which he personally has headed up a vast national program that since 1932 has increased the farmers' gross income by about 2½ billions of dollars.

When we realize that upon the size of the income of Maryland's farm population depends directly the welfare of about 50,000 families, or about 200,000 persons, and indirectly another large percentage of our population, we realize how momentous is the task of our own leaders and to what extent they are charged with the welfare of their fellows.

For the immediate moment we have something closely akin to confusion. There may be dark and troublous hours confronting us, but I know of no group of people in all the world who may be so depended on to display a sane and courageous outlook as that represented by our farm population.

In all history, to me there is no finer example of courage and resourcefulness and splendid effort than that of the rural South following the Civil War. There we had lands laid waste—desolation everywhere—people without equipment and without money, and their civil government for a time dominated by what until then had been a subject race. And yet the rural South went to work with their hands, with a courage and resourcefulness that was measured only by their iron determination to rebuild for themselves and their families and for unborn generations that which had been destroyed. The South was made up of the very kind of people who sit before me today, and when I look into your faces, I know that the same courage that built on the ashes of a destroyed South a new industrial and social empire will carry you through any and all difficulties.

To me the increase in farm income means not so much the tangible dollars and cents by which we are too often prone to gauge all values, but rather the satisfying of human wants and needs. It means that the peo-

ple who have been bravely helping to stretch reduced income to obtain absolute necessities will be able to have in their homes some of those things that contribute most to happiness and contentment. It means that the farm boy and farm girl will get opportunities for development in the way of education that otherwise they could not obtain. What the leaders in the agricultural industry have contributed to the farm income is in reality a contribution to the happiness and contentment and progress of not only those living on the farms, but all those of our people generally whose welfare depends on the purchasing power of agriculture. Thus, it is a contribution to the business welfare of the State, and what is even more important, a contribution toward the building of a better citizenship.

After all, the real resources of our Nation are not its agriculture, its mines and its waters, but its people.

We at the University of Maryland are proud of the services that the University is rendering. We are glad that the University has been able to play its part in recent difficult programs. But our pride, largely, is not only in the benefit of immediate increased financial returns, but in the human progress and happiness that they make possible.

The University of Maryland has very definite plans for increasing and extending the services that it is rendering to the agricultural industry and the rural people of the State. We are particularly interested just now in developing and coordinating our agencies and facilities for service to the live stock, poultry, and dairy industries. But in developing these, the University expects to continue to maintain the high standards of service it renders in other lines.

We want you to know that we understand that the only justification for the University of Maryland lies in its ability to return to the people of the State dividends on every tax dollar appropriated to it, and that the largest direct return the University is giving and can hope to give is through its services to agriculture. We want you to know, further that we realize that the welfare of the State is basically dependent upon the welfare of agriculture and the purchasing power of the farmer, and that we pledge that, to the best of our ability, these shall always be maintained.

The Chairman called for some music, and Mr. McKnight dedicated his first song to the Chairman for the coming night dance,—"I want a girl."

At this point a telegram was read from Chester Davis, Administrator A.A.A., regretting his inability to be present.

MR. JONES: I am going to ask Dr. Symons to introduce these two gentlemen who have come to us in Mr. Davis' place.

DR. SYMONS: Mr. Chairman, and friends of the Maryland Farm Bureau, I am glad to have this opportunity to extend our personal greetings and to reciprocate in a small way the fine cooperation that the farmers

of Maryland have been giving our courses at the college, and the conduct of the work during the past year. I am reminded at this moment of the very wonderful National Convention that was held of the American Farm Bureau in Chicago. I only wish that everyone of our farmers could have been present. I think it was the most significant convention, the most serious that that organization has ever held. At one of the series of meetings, Dean Lippman, of New Jersey, was introduced to represent the Land Grant College. Dean Lippman started his speech with this statement and this story,—he said he was reminded of the fellow who wished for the power of seeing the unseeable, the wisdom of knowing the unknowable, and the ability to unscrew the unscrutable. And so, in these serious times, when we are looking here and there, I am with the previous speaker who said that perhaps these times that are happening and making history, —perhaps it is good for our people; it is certainly good for the Farm Bureau organization, and that is good for all of our people. There certainly is not a farmer in Maryland who cannot realize at this moment the necessity of having strong, able, earnest representatives in Washington conferring now with Mr. Chester Davis, the Secretary of Agriculture, and other leaders in preparing a program, and while we regret we cannot have Chester Davis with us this afternoon,—he is a man that we like in Maryland, because he is practical, he is courteous, and a fearless leader, on the other hand we have with us this afternoon men who have likewise registered themselves as leaders in this nation. Fortunately, neither of these distinguished speakers is a stranger to farmers of Maryland and I can truthfully say for this audience that if Mr. Davis could not have been here we feel that he could not have sent more able representatives than Mr. LaFayette Patterson and Mr. John Norton. I have the distinguished pleasure, my friends, to present a man as your next speaker who is a former Congressman from Alabama, but in Congress and out of Congress he has been the farmers' friend, and for some time now he has been associated with the Agricultural Adjustment Administration, and has rendered able service in this Nation in leading our people in the programs that have been developed throughout the several States. And so, members of the Maryland Farm Bureau, ladies and gentlemen, I have the very great pleasure of presenting Mr. LaFayette Patterson of the Agricultural Adjustment Administration as your next speaker.

Mr. Patterson thereupon presented the following address:

PROGRESS AND OUTLOOK FOR AN AGRICULTURAL PROGRAM TODAY

By LAFAYETTE PATTERSON

Agricultural Adjustment Administration
Washington, D. C.

Mr. President, ladies and gentlemen: The occasion which brings me here today certainly is a very great loss to you. Developments are such that Administrator Davis cannot be with you and I bring a personal message from him expressing his regret that the great pressure of last minute developments and working with those trying to evolve a new agricultural program to carry on prevents him at the last minute from filling this engagement on which he had set his heart.

It would be superfluous for me to tell you of his high regard for you and every member of your organization and his obligation to you for the splendid cooperation in helping carry forward the Agricultural Adjustment Program to the present.

You have learned from press and members of your organization of the recent farm meeting in Washington. As you know, the American Farm Bureau Federation, with all other leading farm organizations, took part. I think I can say there was as fine a spirit in these meetings as I have ever seen, and everyone's mind seemed absorbed in evolving a new agricultural program which would perpetuate what we have gained and advance to further gains. It was pointed out that agriculture must have an approved program. This is not only important for the support of agriculture, but industry, since every industry is linked up with the prosperity of agriculture. It was also stated that these delegates were urged by business in their communities and non-cooperating farmers to do all in their power to get a substitute program.

There are none of us today who can tell just what the future will be, but it was pointed out by that great agricultural leader, Chester C. Davis, in his address at the opening of the farmers' meeting that notwithstanding the breadth of the majority opinion, if farmers are willing and desirous and Congress is willing, the way is still open by which the farmers may still carry on a program and have federal aid in doing it. Another thing was pointed out and I will say that all parties seemed to be in unanimous accord in that, that provisions must be made immediately and as speedily as amounts can be determined and Congress can act, to provide for payment of obligations that have accrued in 1935 and previous programs and contracts.

The three A's has served a splendid purpose as an emergency program; in fact, it saved the day for agriculture and made a magnificent contribu-

tion to general recovery; it has helped to remove the large surpluses from the market and has given us experience and training which must form the basis for any future agricultural programs undertaken. It has also showed farmers the value of working together under the leadership of the federal government and provided them with a knowledge and training which will enable them to make more useful citizens.

I think sometimes that it is a pity that more people in every walk of life have not had an opportunity to understand and appreciate the philosophy and purpose back of the Agricultural Adjustment Act. I think, though, that many good and conscientious citizens in every walk of life will take more pride, as the years come and go, in the fact that they had a small part in this program.

This reminds me of Napoleon at the great battle of Austerlitz, which was turned from defeat into victory at the last moment by courage and daring. It is said that Napoleon had a medal struck symbolic of the battle; on it was inscribed the simple words, "I was there."

We are now concerned by what can be done by the farmers to enable them to go ahead with a farm program without bringing down on our heads consequences which will be disagreeable. As you know, a number of suggestions have been offered. Some of them are palliatives which might meet the situation for a year or two years, but I think I can express the opinion of all parties of this great work when I say that generally the farmers, the Administration and members of Congress are moved by a desire to leave the conditions of agriculture when they shall pass from the stage no worse than when they took it up, and as much improved as possible.

All of us are conscious of the fact that there is a lot of discussion, and a lot of favorable opinion back of the domestic allotment plan, which proposes that payments be made—and the Supreme Court seems to have left the way open for that—upon the domestic portion of each man's production, without any check rein or cooperative brake on the amount of production. From the standpoint of maintaining agricultural income in an improved situation, there is a great deal to be said for it. The thing that bothers us and the thing that should be weighed carefully is the situation that we faced in 1933 and 1934, and consider what sized yields of several important crops, with normal weather, might result from that program. It is well to consider, for example, whether the markets of the world will take and consume the crop of cotton, wheat and other crops, which might result, or whether, on the other hand, with that kind of a program we might not find ourselves facing the situation where again we would have large surpluses on the markets of the world. This goes back to the proposition: What shape would this leave agriculture in when we lay down our responsibilities?

Then, no-one knows whether the temper of the country is such that it would long continue a subsidy of that sort. If under the weight of continuing new supplies, and increased supplies, the price moved downward, and if it was sought to maintain a price based on cost of production, or price based on the parity concept, or any other price level which is fair to the farmer in exchanging his goods for the things he needs to buy, in order to maintain his income, a progressively higher subsidy would have to be paid as the general market price worked down under the weight of the surplus.

These are some of the things that have been considered by the Administration in connection with the Domestic Allotment plan in the light of their experiences. The plan has many good features, but if it is not related to some cooperative effort, a successful cooperative effort on the part of the farmers, to adjust their production efforts to the best market that is available to them, we wonder what will happen.

Now, we are hearing a lot of talk about reviving the McNary-Haugen Bill. You know the principle of that plan was to indemnify exporters and cooperative groups for the difference between the domestic price—under this bill at one time that was called the parity price and at another time it was called the height of the tariff above world prices, whatever they may be—at any rate, the principle was to indemnify exporters for the difference between the world price and that price which would prevail in the United States in order to induce the shipment abroad of the surplus of these commodities and to finance it by the equalization fee. The equalization fee is simply another word for the processing tax—the tax or fee laid on the sale or handling or manufacture of the commodity to raise enough money to pay that export subsidy. A good many of you worked for that from 1923 to 1928. At that time we were lending money abroad which financed the purchase of the surpluses that were going out of this country, and going freely. The McNary-Haugen Bill at that time would probably have worked because we were selling abroad and lending money with which to buy our products. Of course, to the extent that those loans were not repaid, we gave those commodities away. I mean that the United States on the whole gave them away.

Conditions in the United States had so changed that the export markets open to this nation were no longer open to the extent they had been. Some other method, some other mechanics, some other economic mainspring to maintain those farm prices had to be found. You men know the situation abroad induced by our own creditor position, induced by the desire of nations living under the shadow of possible war to become self-sufficient, in order to have essential war materials.

In the situation that has developed now embargoes, quota restrictions, and excessive tariffs have been creating obstacles that you cannot hurdle in volume, no matter how much you subsidize. That is an angle we have

been up against in trying to work out opportunities to sell abroad under subsidy. We have that authority under the Agricultural Adjustment Act, and I would say those powers are untouched by this decision as far as the power to spend goes. The Administration is working all the time on problems related to finding new export outlets. I could, if I had time, give instance after instance where the Administration made a thorough investigation of possibilities of accomplishing a real benefit along that line, and have had to give up in a great majority of cases.

Should we be able to find a market but had to do it at prices so far below the farm cost of production in his country that it would mean, in effect, giving the commodity wholly, or in large part, away, are we wise to do that? As the guardians and custodians of this priceless heritage of the soil and its fertility, are we wise to mine this soil to the limit and ship that soil fertility abroad for nothing, or little more than nothing?

What I am saying about the McNary-Haugen Bill applies, with modifications, to the export debenture proposal, and we approach all these things with the greatest sympathy. But it doesn't seem from our experience that they are likely to work. What we have been trying to do is to bring together the composite opinions and suggestions and see what the representatives and leaders of organized agriculture think about these things.

Another proposal has had considerable support. A bill has been introduced in Congress looking toward it. This proposal would rest on the outright purchase or lease of land. The idea would be that if the government were to lease or buy up land, the 50,000,000 surplus acres to which the Secretary has referred in some of his addresses, could thereby be retired, leaving the agricultural situation in a sound condition, ready to go ahead. This outright purchase only goes part of the way. I am trying to give you the conclusions we have reached from the experience of carrying on a program thus far.

It would seem if this plan were not accompanied by conditions as to the use of the land, you might buy up large areas of submarginal land, then if the farmer were free to plow up all the other land that he had or that was available, you would not influence the total output appreciably.

Another suggestion has been advanced which seems to have merit. It is that the Federal Government might embark on a policy of lending money at a satisfactory price level on the storable agricultural commodities. The proposal is to make as a condition of those loans the adjustment of production of the borrower. The aim would be to accomplish, in effect the same results the farmers have tried to accomplish under the Agricultural Adjustment Act. One thing obviously occurs to the men who have been working with the present program. That is that if such a loan plan worked, and if by reasons of the price fixing loans, the price in this country was secured so as to make the loans safe—that is, holding the

price level up to the loan level—then it is clear that the man who did not take a loan and therefore did not agree to make any adjustment in his production would get precisely the same benefits from it as the man who did cooperate. Old heads in the cooperative movement will recognize the defect in this plan. That is, if the outsider, the non-cooperator, reaps equal benefits with none of the risks over a period of time, the plan, is not likely to stand up.

Any of the plans that are based on government price fixing by direct Congressional act, or Executive act, no matter what you call them, need to be examined from the standpoint of the mechanics. That is, how are you going to make them stand up. The Administration has no quarrel at all with those who want cost of production. But it is necessary, as I see it, to go back of it and back of any other plan which by government action would attempt to fix the price, and satisfy ourselves as to the economic force that will make it stand up and work.

In considering the loan plan that I have just discussed, and in the plans to fix a price, I have not raised any constitutional question. A loan which is conditioned on adjustment of production might be just as unconstitutional, under Mr. Justice Roberts' opinion, as the Agricultural Adjustment Act. The only question would be whether it could be brought into court in such a way that it could be decided.

The price-fixing proposal would probably rest upon the power of Congress to regulate interstate and foreign commerce. We who have been working with the marketing agreements and license plans realize what a sharp and strict line the courts have drawn between interstate and intrastate commerce. The Supreme Court and certainly the lower courts in many areas not particularly sympahtetic to the Agricultural Adjustment Act seem to have taken a much more narrow view on that point than the Supreme Court took in the old Lemke case arising in North Dakota. The Lemke decision seemed to indicate that wheat in the farmer's wagon on the road to the elevator was in interstate commerce. The courts now are not looking at it in that same way, judging from recent decisions. Those constitutional questions are fairly obvious and will occur to you.

The question is, how can you make price-fixing stand up unless the government is ready to buy out of the market all that the trade won't take at the established price. Now, there is no way I know of to compel buyers to take all the farmers will produce at a fixed price. They will take whatever supply they feel confident they can re-sell at margins above that fixed price. What happens to the rest? If it is produced, some agency has to be in position to support that agreed price, or fixed price, by taking it out of the market. When you get that supply, what can you do with it? The Administration, as you know, has done a great deal in buying commodities and distributing them for relief purposes. There is a limit to that. I have already indicated some of the limitations

of finding a market abroad. But back of all those plans the thing to do is to spread the blueprints and find the machinery which, cog by cog, will make the thing work. That, it seems, is what needs to be done in considering Government purchase and stabilization plans of all sorts.

If those who are in positions of some responsibility to agriculture cannot profit by experience, then this thing is hopeless. Personally, I think the Federal Farm Board made a very important contribution to this developing agricultural policy in the United States. One of the things their experience taught us is that it is comparatively easy and simple and popular to buy up and acquire a commodity, but that you get into genuine trouble when you have to let go of it and turn it back into the market. Any plan that depends on purchases, unless you can keep the channels of trade open and can move out what you buy, needs genuine scrutiny.

I have just stated hastily and briefly a few of the things which are being discussed in Washington at this time. I have not raised constitutional questions, except to recognize them in some of the plans now being discussed.

Early last month the Administrator said in addressing the American Farm Bureau Federation in Chicago to the effect; that if the farmers desired it, generally and strongly enough, and if Congress is willing to go ahead, he believed a way could be found in conformity with an adverse Supreme Court decision for the farmers to go ahead with the support of their Government in an agricultural program. In spite of the breadth of that decision, upon careful study, I think Administrator Davis still believes that can be done. It rests, of course, on two assumptions, first, that the farmers want to go ahead, and second, that Congress is willing to do it, and meet the assaults of those who will be ready to say that anything that will work is unconstitutional under the decision in the Butler case. That is exactly what Congress is going to be up against.

In view of the far-reaching Supreme Court decision, conditional payments financed by direct appropriation out of the United States Treasury, but conditioned in such a manner as to go only to farmers who meet conditions aimed to conserve their soil and to bring about positive use of the land taken out of intensive cultivation of crops which are not needed in the volume in which they would be produced, might be worth considering. This program coupled with some form of Domestic Allotment plan and crop insurance might give us a future program which is satisfactory to farmers and the Congress. Certainly, no program will work unless it has the support of the farmers. It should and must be their program.

I want to state here what I have stated before in different parts of the country, that the Secretary of Agriculture and the Administrator of the Agricultural Adjustment Administration are as strong as anybody in

this country for increasing commodities and extending markets. In fact, the philosophy behind the Agricultural Adjustment Act was not one of making commodities scarce, but of adjusting production to consumption, whatever these demands were.

I think I should refer briefly here to the resolutions adopted at the recent conference of representatives of farmers in Washington on January 11. In part, they recommended that the Congress empower the Secretary of Agriculture to provide for rental and withdrawals of land from commercial crop production at equitable rates, which may be necessary to promote conservation of soil fertility; to bring a profitable balance for domestic production with a total effective demand at profitable prices.

Such a program to provide for rentals on a percentage of the total tillable acreage or adjustment by quota of the volume of products; or a combination of both methods; and that the Congress provide adequate funds to carry on soil conservation and a price adjustment program. That provisions be made for the levying of reasonable taxes upon the processing of different classes of livestock and dairy products, whenever approved by an adequate number of producers.

They also asked for the retainment and strengthening of all the valid provisions of the Adjustment Act, and that commodities which shall come into the hands of government agencies for marketing and distributing wherever practicable be done through farm commodity cooperatives qualified under the Capper-Volstead Act, with recommendation that American markets should be preserved for American farmers and expansion of foreign markets for surplus crops.

To get a more comprehensive idea of what this soil conservation program means to farmers may be acquired by studying Administrator Davis' article, "Lost Acres," in the February issue of the American Magazine. Time does not permit that I discuss this with you, but, in my judgment, the study and information back of this article has brought forth a turning point in American agriculture. Among the many things pointed out in this article is that the costs of erosion to farmers in loss of soil fertility alone is about $400,000,000 annually, with 3,000,000,000 tons of soil washed and blown from our fields yearly, according to Soil Conservation Service. These figures are staggering; but we can see evidence on every hand that they are true, nevertheless.

You people who have kept in touch with the development of our Agricultural Adjustment programs, know that within the last few months the purpose of the Administration has headed them gradually since the emergency phase of the Adjustment Act was undertaken, toward a permanent program in soil conservation and adjustment of production along a scientific basis, as we are trying to evolve at this time. Our program would have gradually developed along the same line as is being consid-

ered since January 6. Many of you have seen reference to this in the press several months ago. Some of you heard me refer to this phase of the development of our program in my speeches at Cambridge and Frederick. I can also say that members of the Congress are giving these questions careful and scientific study and I take it on my own responsibility when I say that although there are many clouds on the horizon, there is also a bright lining under these clouds which would indicate that if we go forward with the representatives of the farmers who met in Washington recently, the Administration and the Congress, there will be the dawn of a glorious day with the shining sun.

It is possible that some business and industrial interests will oppose legislation for the farmer, on the grounds that prices of agricultural commodities are no longer in an emergency condition and that all programs should be postponed or abandoned. In taking this position they admit the efficacy of our recent Agricultural Program and show clearly the necessity for carrying on a future program.

No program, of course, will be or can be successful unless sponsored, believed in, and supported by the farmers. I would say that the future of agriculture rests largely on two counts; that in view of court decisions can you evolve a sound program and one which the Congress will go along with and will be within the constitutional limitations set by the decision? Second: do farmers and the millions of others who have benefited from the increase in purchasing power want it enough to do their part?

You stand today where Robert Clive stood at Plassey. Although the river is swollen by great floods and disrupted by great typhoons, will we venture to cross? We are at a new cycle in the annals of agriculture, as well as the human spirit. Will we release the gains, will we refuse to advance with these accomplishments to other gains?

You know what the result will be if the six million farmers of America answer back—"We will not retreat!"

DR. SYMONS: Now, friends, we have a further treat in store for you. Dr. Patterson has laid before us the contemplated plans that are now being worked over.

In regard to the cooperative movement, I think the Dairymen's Association has shown us what cooperation has been able to do for the milk industry in Maryland, and I cannot urge too much the remarks of the previous speakers in considering a proposal of developing a very definite cooperative movement with the other commodities in addition to the milk.

Our next speaker, Mr. John Norton has visited various sections of Maryland. He came to us from the great State of Nebraska. We knew him in Congress as a capable worker for organization and farm help, so he has been generously received, and he will be generously received this

afternoon. I take great pleasure in presenting the distinguished orator from the State of Nebraska, the Honorable John Norton.

MR. NORTON: Dr. Symons, members of the Farm Bureau of the State of Maryland; It is always a pleasure for me when I am privileged to speak to a group of Farm Bureau members, wherever it may be. It is especially pleasant for me to speak to a group of Farm Bureau members in the State of Maryland. Every farm group to whom I have spoken previously, whether in Baltimore or elsewhere, has treated me very generously.

I would have reason to assume at the outset from what my good friend, LaFayette Patterson told you, that I am expected to play a certain part in this program, and only for a very little while, and that reminds me of the outline which a certain colored minister used in delivering a sermon to his congregation. He divided his sermon into three parts,—the first was a text, the second the subject matter, and the third was to whoop it up. Your presiding officers this afternoon gave the text, the various speakers have given the subject matter and there is nothing left for me to do but just to whoop it up.

I am always pleased as I told you when requested to speak in Maryland. That reminds me of the farmer who had a new hand come in, and he sent him out to do the chores. When he came in he asked him "Have you fed the horses?" "Yes." "What did you feed them?" "Hay." "Well, I guess that is all right. Have you fed the cattle?" "Yes." "What did you give them?" "Hay." "Have you fed the pigs?" "Yes." "What did you give them?" "Hay." "Well, that depends on the kind of hay you gave them." "Did you feed the ducks?" "Yes." "What did you give them?" "Gave them hay." "Did they eat it?" "Well, no, but they were talking about it when I came away."

When I spoke at the banquet in this same hotel three years ago on the occasion when the Governor of the State was present, you were so generous to me that I feel I might repeat this illustration that I used then. A certain young man was saving his money, even though he had a sweetheart. The sweetheart was doing the same thing. When they got enough saved, they were going to get married. Well, he had a windfall and he thought he would take his sweetheart out and celebrate. He came home and told his friend all about it. He said they had a wonderful time, he said it cost him $10.00, he paid $5.00 for a concert, and then went to dinner and that cost them $3.00, and then he took her for a drive and that cost him $2.00. "And," he says, "what do you think after my doing all that, when we got home she looked up at me as if she expected me to kiss her." "Well, didn't you kiss her?" "No, by gum, I thought I had done enough for her."

I wish to congratulate you upon your farm organization. If there has

ever been a time in the history of our country when farmers needed organization more than any other time that time is now. Sometimes we become somewhat discouraged, we feel organizations do not get us as far as we had hoped they would, have not accomplished what we had been told they would. That may be due, in part,—not in your case perhaps, to lack of leadership, due to a lack of cooperation on the part of the farmers themselves. How could you think of being able to accomplish what has been accomplished, how could the present administration sense the will of the farmers, how could the Secretary of Agriculture have been able to do as much for the farmers, had it not been for the farm organizations? The present situation shows what agricultural leadership can do. The Secretary proposed a referendum, but that would take so much time, and the farmers need help right now. If it had not been for the organizations, could the Secretary have been able to call those leaders together within one week and outline a program, submit a report to the Department, to the Administration, and also submit that report to the farm leaders in Congress? That is rapid work which you could not have accomplished had it not been for your organizations. You should maintain your organization, build it up and continue your interest in it. That reminds me of the man who received a letter from a kidnapper, to put $1,000 in a certain place, or he would kidnap the man's wife. The man replied "I have not got the $1,000, but I am certainly mighty interested in your proposition."

So I say, maintain your interest in farm organization. You have listened with interest and benefit to the very fine addresses delivered this afternoon upon the subject of the agricultural program, I might say from almost every angle, and there is perhaps little I could contribute or add. This farm problem is not a new one, it has been discussed throughout the ages. But at no time has the farm problem been as acute as it has been in recent years. Now, why has that been so? First, because of what happened immediately following the World War, the unfair competition, the exploitation of agriculture, the cutting in two of buying power, of debt paying power, tax-paying power. That could not have failed to have its effect. For a time industry thought it could stand without agriculture; it was not dependent upon agriculture. With the crash of 1929, even the industrial and financial leaders became convinced that agriculture bore a certain relationship to industry and to business, and it was hoped from that time on we might have the desired relationship between the various groups. In America I might say we do not have it to the extent that we had hoped for. We do have it to a certain extent but it failed apparently because of a lack of understanding of the farm problem by certain leaders in business and industry. Some of them now say "Let the farmers alone, do not try to encourage them to make their adjustments, let them alone, and normal conditions will return naturally." When I was in Congress they came to Congress and insisted that Congress must act al-

ways to save them or their projects, and as a result hundreds of millions of dollars were allotted to the big banks, to the railroads and to the Insurance Companies,—this with the promise that they would bring about recovery, but they did not. Now they are saying "Let Agriculture alone." No, we are not going to let Agriculture alone. This Administration is bent upon one thing,—to save Agriculture just as well as the others because it is interested in the welfare and the progress of the average farmer, it is going to support Agriculture, and that reminds me. Agriculture makes mistakes sometimes, of course it does, but that is a thing of the past. When I think of that as such I am reminded of a story of Ikey who wanted to take a ride in an airplane. He asked "How much?" The aviator said "I will take you up for $25.00.." Ikey says "To much money." Finally the aviator got down to $5.00. "No, too much money." The aviator says "I tell you what I will do.. I will take you and your wife up and if you do not say a word during the ride you will owe me nothing, but if you do speak it will cost you $25." They went up and the plane went through all the stunts, tail spins, loop-the-loop and all, and then they came down. The aviator asked Ikey "Ikey, you are all right?" "Yes, but there was a time when I thought I would have to speak and that was when the old lady fell out."

The triple A. perhaps had mistakes in it, we have to admit that, but the next plan will take what is good from it and leave out the mistakes; we will build upon its foundation. That it has been beneficial no one will deny, but there were advantages gained. I suppose the processors will sue for some of the money they paid, but if I were a member of Congress for one, they would never get a penny of money. They never paid it in the first place, either the consumer paid it or the producer paid it, not the processor. But even so, it has benefitted the farmer. The increased prices have helped to build up buying power, tax paying power on the part of the farmers. No one can or should deny that the Agricultural Adjustment Act has been a great benefit to the farmers. Now that has gone, we must build something different and I am confident in my own mind that we will benefit by it, we will build something of even more benefit. We now know what mistakes were made. We know in the long run what the Administration is aiming at,—a permanent program for Agriculture. I do not know just what form it will take but I am willing to support it. Oley came to this country and he was so pleased he thought he would take out citizenship papers. They told him to hold up his right hand and be sworn. "Do you solemnly promise to support the Constitution?" Oley says, "Mr. Judge, one minute. I have got a wife and six children to support, I can support no more." I am not in that frame of mine. I am supporting the Constitution as it is, I am certain of that. If the Constitution should be amended, it may be done either through the submission of amendments by Congress to the States or by Congressional Convention, and if we find that any program

which we outline will again be thrown out because it is unconstitutional I am of the opinion that the farmers will not take that lying down, they would fight for a change in the Constitution to meet their needs.

I say again I am glad to be with you, you are always generous to me when I come,—I believe we will soon find the sun is brighter, the skies brighter, and a new day dawning for American agriculture.

MR. JONES: Next on our program is the introduction of resolutions. These resolutions may be brought up and will then be submitted to the Committee on Resolutions.

Now we have a very happy duty to perform. I am going to ask Brother Harry Nuttle to come up and make the presentation of the medals to the Vocational Agriculture Boys. I think that is one of the very finest parts of this program.

MR. NUTTLE: We will have a few words from Dr. Cotterman.

DR. COTTERMAN:

Mr. President, Members of the Farm Bureau Federation, Ladies and Gentlemen:

In presenting these young men for Farm Bureau awards, it is always customary for the State Supervisor of Vocational Agriculture to say a few words in the way of introduction. It always seems appropriate to tell who they are and something of the significance of their work.

Who are the F. F. A. boys? They are members of the Future Farmers of America, an organization of high school boys pursuing Vocational Agriculture in the 45 white high schools in the State in which that subject is offered. This organization has a total membership of something over 1800 members. It is hardly necessary for me to say anything in reference to the significance of their work. It is obvious that in many of them you will find prospective leaders in rural communities. Among this group of boys, and the rest of the 1800 of which they are a part, you will find prospective teachers of vocational agriculture, prospective county agents, prospective club agents, and prospective farmers who will become outstanding leaders in farm work. In times like we had before 1929, our surveys show that 60 per cent. of these boys stayed on the farm. Probably 80 to 90 per cent. of them are remaining on farms at the present time. There is no question but that as time goes on they will be outstanding leaders and workers, just as these boys who stand before you this afternoon have already demonstrated their ability to do an outstanding piece of work which deserves recognition.

These medals, as you know are donated by the Farm Bureau organization. They go to boys who have demonstrated that they can do things,

and we know that they can do things or they would not be here this afternoon from the long distances from which some of them have come. In the name of the boys, allow me to thank the Farm Bureau for this recognition of their achievements.

Mr. Nuttle presented the medals to the winners of the F. F. A. project contests.

Meeting adjourned 4.35 P. M.

LIST OF WINNERS IN THE MARYLAND FARM BUREAU--F. F. A. PROJECT CONTESTS FOR 1934-35

Project	Rank	Contestant	High School	Award	
Dairy	1st in Balto. Shed	August E. Lackey	Liberty	Gold	F.F.A. Medal
	2d in Balto. Shed	Lee Norris	Liberty	Silver	F.F.A. Medal
	3d in Balto. Shed	George Firor	Thurmont	Bronze	F.F.A. Medal
Donor: Maryland Farm Bureau Federation.					
Dairy	1st in Wash. Shed	Stewart Walker	Damascus	Gold	F.F.A. Medal
	2d in Wash. Shed	Harold Roderick	Walkersville	Silver	F.F.A. Medal
	3d in Wash. Shed	Edgar Van Fossen	Walkersville	Bronze	F.F.A. Medal
Donor: Maryland Farm Bureau Federation.					
Dairy	1st in Phila. Shed	Paul Horine	Middletown	Gold	F.F.A. Medal
	2d in Phila. Shed	Carroll Horine	Middletown	Silver	F.F.A. Medal
	3d in Phila. Shed	Winfield Bell	Vienna	Bronze	F.F.A. Medal
Donor: Maryland Farm Bureau Federation.					
Sheep	First	Carroll Miller	Boonsboro	Gold	F.F.A. Medal
	Second	Eugene Day	Middletown	Silver	F.F.A. Medal
	Third	Kenneth Renner	Boonsboro	Bronze	F.F.A. Medal
Donor: Maryland Farm Bureau Federation.					
Swine	First	Dorsey Lovell	Middletown	Gold	F.F.A. Medal
	Second	Mason Butler	Poolesville	Silver	F.F.A. Medal
	Third	William Jones	Poolesville	Bronze	F.F.A. Medal
Donor: Maryland Farm Bureau Federation.					
Poultry	First	Clark Nicholson	Poolesville	Gold	F.F.A. Medal
	Second	Carroll Miller	Boonsboro	Silver	F.F.A. Medal
	Third	Milton Anderson	Jarrettsville	Bronze	F.F.A. Medal
Donor: Maryland Farm Bureau Federation.					

Corn	First	Ray Valentine	Emmitsburg	Gold	F.F.A. Medal
	Second	Wilbur Boller	Emmitsburg	Silver	F.F.A. Medal
	Third	Worthington Ridgely	Lisbon	Bronze	F.F.A. Medal

Donor: Maryland Farm Bureau Federation.

Baby Beef	First	Brayden Stine	Boonsboro	Gold	F.F.A. Medal
	Second	Austin Huffer	Middletown	Silver	F.F.A. Medal
	Third			Bronze	F.F.A. Medal

Donor: Maryland Farm Bureau Federation.

Potato	First	Marshall Harvey	Oakland	Gold	F.F.A. Medal
	Second	Lawrence Wensell	Oakland	Silver	F.F.A. Medal
	Third	Harold Draper	Middletown	Bronze	F.F.A. Medal

Donor: Maryland Farm Bureau Federation.

Sweet Corn	First	Donald Eaves	Walkersville	Gold	F.F.A. Medal
	Second	Hanford Cook	Walkersville	Silver	F.F.A. Medal
	Third			Bronze	F.F.A. Medal

Donor: Maryland Farm Bureau Federation.

LEGISLATIVE REPORT—1935 LEGISLATURE

The 1935 Legislature passed many bills affecting Agriculture. The Legislative representive of the Farm Bureau read all bills introduced and followed the progress of 100 bills affecting Agriculture in one way or another. Out of some 1,200 bills introduced in both houses of the legislature some 600 were passed. Many of these were county bills of local interest only, while many had no bearing on Agriculture and some only an indirect effect namely, banking, insurance and motor vehicle laws. All revenue legislation was held up by the delayed passage of the State budget. The budget as first submitted was not satisfactory to the Farm Bureau in many places but chiefly because of—

(1) The diversion of some $4,000,000 of gas tax funds to the general budget. $500,000 of this was taken directly from the 1½ cent gas tax allocated to the counties.

The Farm Bureau fought this diversion with the Highway Users Conference. P. C. Turner, President of Baltimore County Farm Bureau, was chairman of this group. These funds were restored in the supplemental budget.

(2) The $3,350.00 appropriation for the Maryland Agriculture Society was cut out of the budget. This was called to the Governor's attention and was included in the supplemental budget.

(3) The Extension Service appropriation was reduced $18,000 and while this was not included in the supplemental budget Governor Nice has promised to make up the cut from the contingency fund.

EMERGENCY TAXATION

The Senate passed the complete Farm Bureau tax program (except an income tax) calling for luxury taxes and an increase in inheritance taxes. The house of delegates however did not act on these measures but passed a 2 per cent. retail sales tax. The Farm Bureau offered an amendment exempting feeds, seeds, fertilizers and lime which was adopted. This was House Bill No. 532. We opposed this and defeated it in the Senate but it was amended by striking out the entire bill and substituting the 1 cent gross receipts tax. This bill passed and is now in effect. The principal of this tax is bad as it is 1 per cent. levy on gross sales regardless of the profit. A net income tax would have been much fairer; we should continue to urge the passage of said tax.

BILLS SPONSORED AND PASSED

Senate—180 Inheritance tax. Increased rate on collateral heirs from 5 per cent. to 7½ per cent. Added a tax of 1 per cent. on direct heirs. Exempts $500.00 although we asked a $10,000 exemption for widows and children.

Senate—68 Re-enacts the bill providing State aid for county roads by allocating the 1½ cent gas tax revenue to the counties. In the original budget $500,000 of this fund was diverted to the general funds. Strong opposition to this diversion by the Farm Bureau prevented it and secured the restoration of this $500,000 to the counties.

Senate—409 provides that agricultural lime sold in Maryland shall have attached to it information bearing the name of manufacturer or importer, place where manufactured, name of material, trade name or brand, net weight when sold in packages, the fineness of material, the minimum per cent. of basic lime compound, this information to be guaranteed by manufacturers and it provides that the word lime shall not be placed anywhere on a package which has less than 60 per cent. of its total weight in form of oxides or hydroxides of calcium or magnesium.

SENATE BILLS—NOT PASSED—OPPOSED

Senate—312 Unemployment insurance bill that provided by all who employed three persons in any ten calendar weeks of the year, the payment to a State fund of 1 per cent. of the payroll the first year 2 per cent., the second, and 4 per cent. thereafter. Board and room to be included in the calculation of the payroll. Agriculture was not exempt as in other States. This bill was opposed and stopped.

HOUSE BILLS—SPONSORED AND PASSED

House Bill—175—Fresh egg law. Originated by poultry council and State Bureau of markets and backed by all farm organizations. This bill provides that eggs sold as fresh shall meet certain standards and be a direct benefit to Maryland poultry producers.

House Bill—174—Prohibits sale of inedible eggs and regulates sale and handling of broken out eggs.

House Bill—123—Permits cooperatives to borrow on rotating stocks of goods.

House Bill—458—Amends so that the cantaloupes being transported in closed containers be mature as specified in present law.

House Bill—322—Ice cream bill provides for specified standards of ice cream and other milk products.

House Bill—511—Requires permits for all buyers of milk and cream other than for private use and provides same shall have a licensed tester and that standard equipment be used in the tests. University of Maryland, College Park is in charge of the enforcement of this law.

House Bill—576—Provides for the establishment of a Rehabilitation corporation in Maryland to handle government money needed in the rehabilitation of farmers in the State. .

HOUSE BILLS AMENDED

House Bill—168—Milk Control Board. This act, an administration measure, was amended to make it an arbitration board. The provision added was that the board be given power only when requested by a substantial number of producers, dealers or consumers. It was further amended to provide that the board be appointed by the Governor, from a list of twelve recommended by the State Board of Agriculture. It is hoped that the services of this board will never be needed.

HOUSE BILLS NOT PASSED—SPONSORED

House Bill—567—Provided for the licensing of cattle dealers and further provided penalties for misrepresentation or fraud on part of dealers. A good bill lost in the last minute legislative rush.

HOUSE RESOLUTION—NOT PASSED—OPPOSED

House Resolution No. 2—Ratifying Child Labor amendment.

THURSDAY AFTERNOON, JANUARY 16

MR. NUTTLE, Presiding

MR. NUTTLE: We hope that you will come in and sit down as we want to get started, we were twenty-five minutes late yesterday, and it is hard to make up that time. It is with distinct pleasure that I have the honor to present to you as your presiding officer this afternoon, the President of the Washington County Farm Bureau. Mr. Weagley is one of our most faithful and able leaders. He has been in Farm Bureau work for many years. He is one on whom we can always rely, and it is with pleasure that I will now turn the meeting over to Mr. R. C. F. Weagley, President of the Washington County Farm Bureau.

MR. WEAGLEY: Mr. President and folks of the Maryland Farm Bureau, I want to assure you before I start on this program this afternoon that the presiding officer at these afternoon programs has very little to do with the caliber of the program. I feel sure that whoever selected the ones to to preside at these programs realized that the program on Thursday afternoon would be the outstanding program of the Convention, and for that reason it would not need a presiding officer of the caliber we had yesterday. Now for the program. First we will have the report of our Credentials Committee, Mr. Sam Linton, Chairman.

The report was given as follows:

REPORT OF CREDENTIAL COMMITTEE

County	Members Paid-up	Number of Directors	Number of Delegates
Anne Arundel	56	1	1
Baltimore	478	1	10
Caroline	194	1	4
Carroll	98	1	2
Cecil	84	1	2
Charles	104	1	2
Dorchester	94	1	2
Frederick	539	1	11
Harford	308	1	6
Howard	111	1	2
Kent	204	1	4
Montgomery	177	1	4
Prince George's	164	1	3
Queen Anne	219	1	4
Talbot	138	1	3
Washington	141	1	3
Wicomico	142	1	3
Worcester	64	1	1

	Number of Directors	Number of Delegates
Maryland Stockmen's Association	1	1
Maryland State Horticultural Society	1	1
Maryland State Poultry Council	1	1
Maryland Cooperative Milk Producers, Inc.	1	3
Maryland Tobacco Growers Association	1	3
Hillsboro-Queen Anne Corporation	1	1
Maryland Vegetable Growers' Association	1	1
Maryland State Beekeepers Association	1	1
Maryland Crop Improvement Association	1	1
The Agricultural Corporation of Maryland	1	3
Maryland State Horsebreeders' Association	1	1

Respectfully submitted,

SAMUEL C. LINTON, *Chairman*,
A. G. ENSOR,
C. ASHBY DUVALL,
LINWOOD O. JARRELL,
JOHN W. SMITH.

Mr. President: We find 18 counties represented and 18 directors representing them with a total of 67 voting delegates and 15 Home and Community Chairmen. Ten affiliated organizations are represented with 10 directors and 14 voting delegates.

The following report was submitted by Dr. T. B. Symons, treasurer for the State fund, to the Directors and upon motion was duly approved.

MARYLAND AGRICULTURAL SOCIETY, MARYLAND FARM BUREAU FEDERATION
FINANCIAL STATEMENT FOR FISCAL YEAR 1933-1934

Appropriation for 1933-1934 ..... $3,350.00

Expenditures:

Date	Payee	Classification	Expended
1933			
Nov. 28	Md. Farm Bur. Fed.	Office Rent (October and November)	$106.66
28	P. D. Brown	Community Ex. (Charles County)	25.00
28	W. H. Evans	Community Ex. (Caroline County)	25.00
Dec. 13	Md. Farm Bur. Fed.	Office Rent (December)	53.33
13	H. M. Carroll	Community Ex. (Harford County)	25.00
13	J. B. Morsell	Community Ex. (Calvert County)	25.00
1934			
Jan. 10	Md. Farm Bur. Fed.	Office Rent (January)	53.33
10	R. K. Remsburg	Community Ex. (Washington County)	8.30
10	Elsie M. Hill	Community Ex. (Allegany County)	20.00
22	M. G. Bayless	Travel (Baltimore Annual Meeting)	3.35
22	K. G. Connolly	Travel (Baltimore Annual Meeting)	10.80
22	Marion L. Olivet	Travel (Baltimore Annual Meeting)	5.30
22	C. E. Phillips	Travel (Baltimore Annual Meeting)	16.03
22	Md. Crop. Improve. Assn.	Community Ex. (An. Corn and Potato Show)	138.00
30	Md. Penitentiary	Printing (Programs, An. Meeting)	37.50
30	Henrietta D. Stonestreet	Printing (Reporting An. Meeting)	50.00
30	P. G. Stromberg	Printing (Asst. Recording An. Meeting)	75.00
30	Md. Farm Bur. Fed.	Travel (5 Assts at An. Meeting)	25.00
30	Md. Farm Bur. Fed.	Travel (3 Rep. at Chicago An. Meeting)	102.50
Feb. 2	R. S. Brown	Community Ex. (Talbot County)	25.00
2	H. R. Shoemaker	Community Ex. (Frederick County)	25.00
6	Sheldon W. Funk	Travel (Speak at An. Meeting)	22.80
6	Frederick Z. Hartzell	Travel (Speak at An. Meeting)	30.15
6	W. S. Hough	Travel (Speak at An. Meeting)	11.85
6	H. W. Miller	Travel (Speak at An. Meeting)	12.88
6	H. H. Whetzell	Travel (Speak at An. Meeting)	26.28
6	Md. Farm Bur. Fed.	Office Rent (February)	53.33
12	Miles H. Fairbank	Other Exp. (Labor rpts., annual and committee meetings)	25.00
27	20th Century Printing Co.	Printing (Pt. Grange An. Report)	50.00

Date	Payee	Classification	Expended
Mar. 15	Md. Farm Bur. Fed.	Office Rent (March)	53.33
15	Harold Remsburg	Community Ex. (Washington County)	8.33
April 16	Railway Express Agency	Office (Proof An. Report)	.38
16	Sterling Eng. Co.	Printing (Halftones An. Report)	13.93
16	Md. Farm Bur. Fed.	Office Rent (April)	53.33
May 7	Railway Express	Office (Annual Reports)	1.26
7	Md. Farm Bur. Fed.	Office Rent (May)	53.33
7	M. D. Moore	Community Ex. (Washington County)	8.33
June 18	Railway Express	Office (Proof An. Report)	.36
18	Day Printing Co.	Printing (Annual Reports)	562.20
18	Md. Farm Bur. Fed.	Office Rent (June)	53.33
30	Cent. Pur. Bur. Warehouse	Printing (Account forms)	.26
July 25	Day Printing Co.	Printing (Extract An. Report)	9.00
25	Md. Farm Bur. Fed.	Office Rent (July)	53.33
Aug. 28	M. T. Johnson	Postage	75.00
28	T. B. Symons	Other Exp. (Labor, rpts., annual and committee meetings)	30.00
28	K. G. Connolly	Other Exp. (Labor, An. Rpts., Accts.)	20.00
28	A. H. Snyder	Other Exp. (Labor, An. Rpts., Prog.)	10.00
28	Md. Farm Bur. Fed.	Office Rent (August)	53.33
28	Anna Trentham	Community Ex. (Baltimore County)	12.50
29	Seth P. Taylor	Community Ex. (Sweet Potato Ex.)	100.00
Sept. 13	Balto. Assn. of Commerce	Printing (Agrl. Industry of Md.)	25.30
13	King Bros.	Printing (Pub. "Try It")	23.50
13	Md. Penitentiary	Printing (Aug. News)	37.50
13	Moore & Co., Inc.	Printing (Account sheets)	34.50
13	Univ. Md. Storehouse	Printing (Pub. 'Md. Dairy Prod.")	14.00
13	M. H. Berry	Travel (Timonium Ex.)	5.50
13	L. W. Ingham	Travel (Timonium Ex.)	12.15
13	T. B. Symons	Travel (Committee Meeting)	2.15
13	T. B. Symons	Travel (Scrip, Comm. Meetings)	30.00
13	Army & Navy Trad. Co.	Community Ex. (Timonium Ex.)	5.25
13	W. A. Middleton Co.	Community Ex. (Timonium Ex.)	7.52
21	H. C. Barker	Travel (Timonium Ex.)	30.74
21	O. R. Carrington	Travel (Timonium Ex.)	7.70
21	John A. Conover	Travel (Timonium Ex.)	11.02

Date	Payee	Classification	Expended
21—	C. S. Richardson	Travel (Community meetings)	30.10
21—	C. E. Wise, Jr.	Travel (Community meetings)	100.00
21—	H. J. Twilley	Travel (Timonium Ex.)	3.70
21—	Md. Farm Bur. Fed.	Office Rent (September)	53.37
21—	John A. Conover	Community Ex. (Timonium Ex.)	19.58
25—	Addressograph Company	Office (Mailing List)	12.90
25—	Maryland Penitentiary	Printing (Pub. Sweet Potato)	30.00
25—	Maryland Dairy Council	Community Ex. (Timonium Ex.)	48.15
25—	Md. Farm Bur. Fed.	Community Ex. (Timonium Ex.)	45.00
25—	E. G. Jenkins	Community Ex. (Timonium Ex.)	44.49
25—	Joseph M. Vial	Community Ex. (Timonium Ex.)	11.54
25—	E. P. Walls	Community Ex. (Timonium Ex.)	21.06
26—	Univ. Md. Store	Office (Supplies)	28.00
26—	Univ. Md. Store	Office (Supplies)	7.10
26—	Maryland Penitentiary	Printing (Letterheads)	87.38
26—	Maryland State Grange	Printing (Pt. Grange An. Report)	85.34
26—	Md. Farm Bur. Fed.	Printing (Planograph pictures)	64.59
26—	Dorothy Emerson	Community Ex. (Girls' Clubs)	151.95
		Total Appropriation	$3,350.00

This account is audited by the State Auditor.

T. B. SYMONS,
Treasurer.

MARYLAND AGRICULTURAL SOCIETY, MARYLAND FARM BUREAU FEDERATION

FINANCIAL STATEMENT FOR FISCAL YEAR 1934-1935

Appropriation for 1934-1935 ..... $3,350.00

Expenditures:

Date	Payee	Classification	Expended
1934			
Oct. 23	Md. Farm Bur. Fed.	OfficeRent (October)	$53.33
23	Kent Co. Homemakers Clubs	Community Exh. (Kent County)	12.50
Nov. 9	Md. Farm Bur. Fed.	Office Rent (November)	53.33
9	P. D. Brown	Community Exh. (Charles County)	25.00
28	John H. Carter	Community Exh. (Garrett County)	64.72
28	W. H. Evans	Community Exh. (Caroline County)	25.00
28	J. B. Morsell	Community Exh. (Calvert County)	25.00
Dec. 19	Burroughs Adding Machine Co.	Office (Adding machine)	25.00
19	Md. Farm Bur. Fed.	Office Rent (December)	53.33
19	R. S. Brown	Community Exh. (Talbot County)	25.00
1935			
Jan. 8	Md. Farm Bur. Fed.	Office Rent (January)	53.33
8	H. M. Carroll	Community Exh. (Harford County)	25.00
8	Horace B. Derrick	Community Exh. (Baltimore County)	12.50
8	Harold A. Remsberg	Community Exh. (Washington County)	8.33
18	H. D. Stonestreet	Printing (Reporting An. Meeting)	100.00
18	G. W. Clendaniel	Travel (Ushers, An. Meeting)	10.04
18	K. G. Connolly	Travel (Balt. An. Meeting)	12.34
18	Leone E. Duvall	Travel (Balt. An. Meeting)	7.15
18	Dorothy Emerson	Travel (Chicago)	60.00
18	George L. Schuster	Travel (Balt. An. Meeting)	5.58
18	R. F. McHenry	Community Exh. (Allegany County)	20.00
18	H. R. Shoemaker	Community Exh. (Frederick County)	25.00
26	L. C. Burns	Travel (Usher, An. Meeting)	2.70
26	H. B. Cordner	Travel (Balt. An. Meeting)	4.32
26	J. W. Magruder	Community Exh. (Howard County)	17.00
Feb. 14	Victor R. Boswell	Travel (Balt. An. Meeting)	2.77

Date	Payee	Classification	Expended
	14—Gustave Burmeister	Travel (Balt. An. Meeting)	3.50
	14—Dr. J. H. Gourley	Travel (Hort. An. Meeting)	39.98
	14—Edwin Gould	Travel (Hort. An. Meeting)	10.70
	14—Byron T. Roberts	Travel (Hort. An. Meeting)	18.30
	14—Md. Farm Bur. Fed	Office Rent (February)	53.33
	14—Md. Crop Imp. Assn	Community Exh. (An. Corn and Potato Show)	158.00
Mar.	6—Henry C. Whiteford	Travel (Balt. Committee Meetings)	16.20
	6—Md. Farm Bur. Fed	Office Rent (March)	53.33
	6—R. K. Remsburg	Community Exh. (Washington County)	8.33
	14—Day Printing Co	Printing (Grange Reports)	150.50
	14—W. R. Harvey, Mgr	Community Exh. (Balt. Livestock Show)	60.00
April	15—Day Printing Co	Printing (Reports Veg. Growers Assn.)	24.00
	15—Md. Farm Bur. Fed	Office Rent (April)	53.33
	15—Clarence B. Mason	Community Exh. (Washington County)	8.33
	26—Express Agency	Office (Proof Annual Report)	1.55
May	15—Henry C. Whiteford	Travel (Balt. Committee Meetings)	10.80
	15—Md. Farm Bur. Fed	Office Rent (May)	53.33
June	26—Univ. Md. Store	Office (Supplies)	11.00
	26—Express Agency	Office (Proof Annual Report)	.36
	26—Day Printing Co	Printing (Annual Reports)	613.40
	26—Md. Farm Bur. Fed	Office Rent (June)	53.33
July	29—T. B. Symons	Other Exp. (Labor, Rpts., Annual and Committee Meetings)	30.00
	29—K. G. Connolly	Other Exp. (Labor, An. Rpts., Accts.)	20.00
	29—A. H. Snyder	Other Exp. (Labor, An. Rpts., Prog.)	10.00
	29—Md. Farm Bur. Fed	Office Rent (July)	53.33
	29—Helen N. Schellinger	Community Exh. (Kent County)	12.50
Aug.	2—Sterling Eng. Co	Printing (Cut, An. Rpt.)	4.45
	2—C. E. Wise	Other Exp. (Labor, Rpts., Annual and Committee Meetings)	25.00
	8—Maryland Penitentiary	Printing (Poultry Folders)	24.00
	8—Univ. Md. Press	Printing (Poultry Programs, etc.)	34.50
	8—Samuel C. Linton	Travel (Va. & N. C.)	24.27
	8—Huyette B. Oswald	Travel (Pr. Geo. Co.)	1.80
	8—Md. Farm Bur. Fed	Office Rent (August)	53.33
	29—Express Agency	Office (Annual Reports)	1.03
	29—Huyette B. Oswald	Travel (Pr. Geo. Co. & Wash.)	20.88

Date	Payee	Classification	Expended
	29—Anna Trentham	Community Exh. (Baltimore County)	12.50
Sept.	16—Univ. Md. Store	Office (Supplies)	11.06
	16—Harlowe Composition Co	Printing (Poultry program)	13.00
	16—Keith G. Acker	Travel (Bel Air—Livestock)	16.06
	16—M. H. Berry	Travel (Timonium)	6.14
	16—Geary Eppley	Travel (Upper Marlboro Show)	2.87
	16—L. W. Ingham	Travel (Timonium)	8.47
	16—DeVoe Meade	Travel (Timonium)	6.95
	16—A. Morris Todd	Travel (Hartford, Conn., Veg. Growers)	42.90
	16—Univ. Md. Dining Hall	Travel (Poultry Meeting)	24.79
	16—Margaret T. Johnson	Communication (Postage)	75.00
	16—Md. Farm Bur. Fed	Office Rent (September)	53.37
	16—O. R. Carrington	Community Exh. (Exhibit Material)	100.00
	30—H. C. Barker	Travel (Md. Points, Dairy)	114.79
	30—H. C. Barker	Travel (Md. Points, Dairy)	41.08
	30—John H. Carter	Travel (Columbus, Ohio)	45.12
	30—E. G. Jenkins	Travel (Columbus, Ohio)	64.95
	30—C. S. Richardson	Travel (Millersville Commun. Meet.)	21.43
	30—L. W. Ingham	Travel (Timonium)	7.05
	30—W. R. Ballard	Travel (Md. Points, Community Work)	9.49
	30—Mark M. Shoemaker	Travel (Md. Points, Community Work)	25.67
	30—H. A. Edge	Travel (Md. Points, Community Meet.)	47.06
	30—Dorothy Emerson	Community Exh. (Club Girls)	155.29
		Total Expenditures	$3,350.00

This account is audited by the State Auditor.

T. B. SYMONS,
Treasurer.

MARYLAND AGRICULTURAL SOCIETY-MARYLAND FARM BUREAU FEDERATION BUDGET, 1935-1936

		Allotments
1.	Office Supplies and Stationery	$ 50
2.	Printing	1,200
3.	Traveling	500
4.	Communication	75
5.	Other Expenses	85
6.	Rent	640
7.	Community Exhibits	800
	Total	$3,350

MR. WEAGLEY: During the National Farm Bureau Convention in Chicago, I happened to be sick in bed. The delegate who went from Washington County wrote me a letter, and in that letter he stated that he was glad to represent a County and a State that played such a prominent part in the National Convention. He spoke first of the winner of the second place in the National Speaking Contest for the ladies, and he spoke of her talk, and it is with pleasure that I present to you at this time the winner of the second place in the National Speaking Contest, Mrs. R. G. Spoerlein.

MRS. SPOERLEIN: Mr. Chairman, ladies and gentlemen; It is with great pleasure that I was able to bring back some honor to our friends. I never am quite satisfied not to reach the top, but I was pleased to come within such a short distance from the top at least, and I wish I could give you my talk this afternoon as I gave it in Chicago.

(N. B. Mrs. Spoerlein then proceeded to give her original talk).

THE FARM HOME AND THE WORLD TODAY

By MRS. RANDALL SPOERLEIN
New Windsor, Carroll County, Maryland

When the pilgrim fathers first set foot on American soil, they were happy in their new-found freedom. They were awed by the responsibilities that freedom brought to them—the responsibility of establishing homes in face of the dangers constantly lurking around them—the responsibility of building communities in the wilderness and of laying the cornerstone of the Nation which now is.

The first American home was a rural home, independent and self-sustaining. The world lay around it unknown, and held no claim upon it. Yet, so solid was the foundation of that pioneer home that there has been reared a Nation, proud, independent and unafraid. A Nation the world should honor and respect.

In our complex civilization, the farm home can no longer be self-centered. Nor can we who live in it escape our obligation to society, to religion, to industry, and to our government and the world at large. Every rural home today is in constant touch with all parts of the world through the radio and the associated press, two tremendous factors in the regime of our national affairs. We are no longer confined to the solviug of our home and community problems, but we are face to face with national and world problems.

There are two characteristics of the rural home which have always been outstanding contributions to American life—character and courage. There is no better place for building character than by constantly working with mother earth and learning her secrets of better plant life and by the study of animal life and its highest development. Throughout our history, the creators of the American home have been fearless, yet in the past five years, especially, the very watchword of our farm homes has been courage,—courage to face discouragements, disappointments, and disaster which has threatened our agriculture. We have been bold, persistent and confident in the face of pending disaster.

Much of the credit for these three requisites belongs to the farm woman, for she has widened her sphere of interest from home to State and national affairs. She has studied industry and its effect upon the finances of her home and community. She has become interested in cooperative buying and selling and has come to realize the advantage of selling the farm products direct to the consumer. She has come face to face with civic affairs and is taking an active part in politics by the side of her husband. Yet, with all these new responsibilities, she is a co-worker with her family in the serious business of the agricultural industry. As the pioneer mother was the restrained power in the American life of yesterday, the mother of today is the unrestrained, dynamic power of today's American life.

Someone has said that the industry of farming is the one business in which father, mother, children, hired help, animals and the soil cooperate with God in giving the world its daily bread. That is why it builds character and courage. The farmer must be persistent in face of discouragement, and he must have an undying faith in God, who is his senior partner, that all will be well.

Another important factor to be considered is the relation of the farm home to the church. Up until a quarter of a century ago our country knew only competitive denominationalism and then began to dawn a new era, an era of cooperation and practical Christian fellowship. The rural community contributed an important part in bringing about this new movement. The young people of the rural home saw with increasing clarity the advantage of cooperation in their farm and community organizations and asked the question "Why can we not cooperate in church activities as well?" It was the same cooperative idea of industry carried

into our rural religious life. Today we are one with our city neighbor in a united, organized movement to uphold the principles laid down by the Christ that our world might know them and be made better by them.

In the past decade, the farm home has done much toward higher education in our rural communities, but there is much more to be done. Statistics show us a picture of a great rural State defaulting on more than two-thirds of its legislatively stipulated payments to local school districts, while at the same time spending millions for building improvements. Are marble halls of greater importance than our rural children? Are we so stupid that we are falling down, instead of ascending the ladder of solving our educational problems? Is not the world touching our future America when it touches the welfare of the children in our farm homes?

Another important factor is the effect of the producers' prices on the world trade. It was but a few years ago the farmer took the prices set upon his produce as a thing not to be questioned. The farm home was deprived of the luxuries of the city home. Today they are equal in convenience and luxury. Why? Because the producer has at last awakened from his long sleep and is beginning to demand value due him. For example, the cooperation of the cotton farmers and its most gratifying results; the cooperative distribution of milk, poultry, eggs, and practically every farm product that is handled with the producer in mind, as well as the consumer. This is not only true of America, but practically the whole world. Farmers' real income must take into account not only prices at which they sell, but the amounts sold and the cash income from other sources. Then, this total cash income must be measured against the farmers' costs. In April, 1935, the farmers' cash income totaled $507,000,000 compared with $387,000,000 in April, 1934. The department of commerce reports that the consumers paid their bills more promptly in 1934 than in previous years. There is a point of balance which must be found by both the farmer and consumer. Will our world trade be effected by this point of balance?

Samuel Rezneck in a recent article quotes, "The countryman with his dirty acres is richer than the tradesman on paper pinions—and if country people could but unite against disorganizers as they greatly outnumber them, they could put them down at once." The world of agriculture is awakening to the reality of this statement and is fighting for the security of our farm industry and our farm homes.

The world is challenging us;—the tillers of the soil—to make safe the industry that we love and the industry that feeds the millions—to build that industry upon the foundation of right thinking, square dealing, and cooperative effort. The challenge comes to the farm home for young men and women who are God-fearing, clean in soul and body, who are bold, persistent and courageous.

The security of the world today rests upon the farm home and it is your responsibility and mine to meet this tremendous obligation.

MR. WEAGLEY: I am sure from the response you gave Mrs. Spoerlein that you are all of the same opinion as the delegate from Washington County.

At this time I am going to introduce to you a Washington Countian who will introduce our distinguished speaker, Dr. Bomberger.

DR. BOMBERGER: Ladies and gentlemen, fellow citizens of our great State, when the present Administration came into power in Washington, one of the first projects undertaken was the formulation of a system of agricultural credit. When they looked about for some one to undertake the leadership of this project they selected a man whose previous experience in agricultural programs and his contact with public affairs nationally as related to agriculture fitted him best for the position.

Under his direction the legislation was formulated by which the system was brought into existence, and when later Governor Morgenthau was drafted to the Treasury of the United States, he was placed in charge of the administration of the plan. Under his direction this system of farm credit has developed, and I believe it has prospered, and has established its roots soundly in the agricultural business of this country. I think we are especially favored to have with us today the man who is more than anyone else,—to whom is due the accomplishment of the establishment of this country on a permanent system of cooperative agriculture, and I deem it a special privilege to be able to present to you at this time Governor W. I. Myers, who will address you on the topic,—"Building a Permanent System of Cooperative Credit."

BUILDING A PERMANENT SYSTEM OF CO-OPERATIVE CREDIT

By GOVERNOR W. I. MYERS, Farm Credit Administration
Washington, D. C.

Dr. Bomberger, Mr. Chairman, ladies and gentlemen, friends: It is a real opportunity that I am afforded to come here and discuss with you some of the problems of the organization with which I am associated. I am especially glad to do it because the organization which has brought you together is one which is working for higher standards of country life, for the welfare of farm people. We, in the Farm Credit Administration, are attempting to work with you in that project.

In another way I am glad to do it because I believe, I hope, that there are represented in this group some of the real owners of the Farm Credit Administration, and to you I wish to report on some of the problems, per-

haps some of the accomplishments, and to state, if possible, some of the future policies of this organization.

We all recognize, I am sure, that improvement in agricultural conditions, improvement in economic conditions of agriculture, requires restoration of farm prices and reduction, as far as is reasonably possible, in fixed rates.

There are many fixed charges on many items of cost to the farmer, but two of the principle fixed charges are taxes and interest on debts. The work of the Farm Credit Administration is directly concerned with the interest problem. Our job, as I see it, is that of attempting to assist farmers in obtaining credit required by their business and on terms suitable to the needs of the farming industry, and at the lowest possible cost. The time I have allotted to me today I wish to devote in the main to looking at the future, but in order to get perspective, perhaps we might pause for a moment and list as briefly as possible some of the problems with which the Farm Credit Administration has been faced during the two and a half years of its life.

This busy period of two and a half years has seen a number of major problems. First and foremost among these was the problem of stopping farm foreclosures, and assisting in re-financing the burden of debt that had increased because of the depression. In carrying forward this program almost two billion of re-financing loans have been made on mortgage loans in the United States, to refund and re-finance debts of worthy farmers upon a basis to permit them to work out as conditions improve. The burden of debt has been reduced as a result of this operation and in the current fiscal year ending on June 30th next the interest payments of about 800,000 farmers have been reduced by about $55,000,000 for the year, the saving in the $55,000,000 of debts re-financed in this district amounts to approximately $2,000,000 for this year. That is a direct saving.

In addition to that the operations of the Farm Credit Administration have been influential in reducing rates of private lending agencies, and that saving indirectly has been almost if not quite as important as the direct savings.

Another job has been the building of a Production Credit system to make available to farmers and stockmen a permanent system through which credit could be obtained for financing the operation of the farms.

A third task, and one with which Dr. Bomberger has been closely and very successfully identified has been the establishment of banks for co-operatives, the successors to the Farm Board, which have the responsibility of making business loans to farmers' co-operative marketing and purchasing organizations to help them become sound and efficient.

We have had some other jobs each year. Because of drought or depression a large number of emergency crop loans during the year 1935

were made, over 400,000 emergency crop loans to farmers who had no other source of credit to enable them to carry on their operations and continue as self-supporting members of society. A year ago on account of the drought we were called upon to make a large number of emergency feed loans in the drought areas, primarily to stockmen who had no other source of credit to enable them to buy the feed to maintain their foundation herds so that they might participate in the improvement of conditions that have been evident.

During the past year we have been liquidating in an orderly fashion the original Agricultural Credit Corporations which were not very important relatively speaking in the Eastern States, but which were important in saving the livestock industry of the United States from forced liquidation in 1932 and 1933. We have liquidated those loans permitting farmers to refund or re-finance those obligations in a permanent system or with private agencies. In passing I might tell you that over $300,000,000 in loans were made by the original Agricultural Credit Corporations. Those loans have been liquidated approximately $43,000,000. In the past month or so I have had the pleasure of submitting to the Reconstruction Finance Corporation a proposal that they provide the additional capital to liquidate the rest of them.

Another job that has been submitted to us has been that of assisting worthy, qualified young men in financing the purchase of farms. During the depression the normal movement of young men toward farm ownership was delayed, and believing that it is sound National policy to promote the ownership of farms, Congress a year ago gave us the responsibility or the opportunity of rendering the necessary financial assistance to men in the purchase of farms. Before we had the right to re-finance loans already made, but now we are permitted to make the loan for the original purchase to young men who wish to become farmers, and own their own farms. We can lend about 75 per cent. of the normal value of the farm, and you men know that that is about the maximum debt that a good man can be expected to carry and pay his overhead.

Now, these jobs that I have mentioned have been partly emergency jobs, and they have been partly emergency loans of a long-time program, and the minds of the general public are confused, they have the idea that the Farm Credit Administration is primarily concerned with the lending of the Government's money. I never get up on my hind legs to talk that I do not try to emphasize that point, that the primary purpose of the Farm Credit Administration is not lending the Government's money, but to aid the farmers. The loans that we have made during this emergency period can be classed in two different classes. One is where there is a special risk and where we have acted as the agent of the Government in lending Government funds where because of special risk it is impossible to get funds from investors by the sale of securities and yet

where Governments funds may be used to help people become re-established. Those loans were the Land Bank Commission loans, made to the amount of $800,000,000. They are made in addition to or in some cases in place of the Land Bank Mortgage. Land Bank Commission loans can be made on second mortgage and most of them have been. And the second mortgage plus the first could not exceed 75 per cent. of the normal value of the farm. Those $800,000,000 of Commission's loans have been made in accordance with laws passed by Congress out of government guaranteed bonds,—in other words directly out of government money. The Emergency Crop Loans, Feed Loans and other examples are strictly Government loans made from appropriated funds in accordance with the mandates of Congress. These emergency loans have declined in importance as improvement has continued, and they may be expected to pass as emergency passes, and as normal conditions recur.

The permanent part and the major task of the Farm Credit Administration is that of acting as an organization through which individual farmers and their co-operative organizations can reach the investment market. Here and in this district right here in Baltimore we have the headquarters of one of the District Commissioners of the Farm Credit Administration as possibly some of you know. There are twelve of them in the United States and this, the second, has headquarters in Baltimore City, and it includes Pennsylvania, Maryland, Virginia, West Virginia and Delaware. These permanent institutions provide a system of agricultural credit on the co-operative plan. There are three types of credit service that are made available in this permanent system,—a mortgage credit service to individual farmers that is provided by the Federal Land Band and local National Farm Associations,—there is the Production Credit System that is made up of the local Production Credit Association, the P. C. A. as we call that system, and the Emergency Credit Bank which is their wholesale source of credit, and a system of credit for co-operatives, including both long term and short term loans made available through the banks for co-operatives, with the assistance of the Emergency Credit banks.

Now, the loans funds for these permanent credits are not obtained by the sale of agricultural securities. The Federal Land Bank obtained the funds by the sale of Federal Land Bank bonds, and those bonds are based on first mortgages on good farms in this State, and the amount of each mortgage cannot exceed 50 per cent. of the normal value of the land and 20 per cent. of the insured improvements. In 1933 before this emergency plan went into effect the Land Bank had outstanding one billion on mortgage loans on American farms. Every dollar of that money was obtained by the sale of Federal Land Bank bonds, etc., to investors. The only deviation in this picture the last two years has been this. We have had to add another billion dollars to the Land Bank loans in a short period. In this emergency a scheme was devised whereby the Government bought

Federal Land Bank bonds, furnished the market, and the Federal Government bought between seven and eight hundred thousand dollars of bonds. Those bonds had back of them the Federal Land Bank mortgages made by good farmers in the past two and a half years. The Government will expect those bonds to be paid, and to pay them it will be necessary to collect the mortgages during this time. We have looked forward to the period when this temporary plan for marketing Federal Land Bank bonds would be at an end and today it is at an end. In December we were able to call some Federal Land Bank bonds that were issued ten years or so ago, and refund them at a lower rate,—in this case 3 per cent. bonds offered more than what was necessary to refund the callable bonds. In fact we offered $100,000,000,—more than necessary to refund and that excess was to obtain new money to continue to make new Federal Land Bank loans. The Federal Land Bank bonds are now on the bond market to obtain funds for new loans from the sale of these bonds.

The Emergency Credit Banks are little understood by many farmers. Their capital of upwards of $100,000,000 was paid in by the Government when they were set up; their capital was originally $60,000,000. That was in 1933. Their present capital, paid-in capital is $100,000,000. Most of that capital is invested in securities. The present, average cost is less than 1 per cent. per year, and they are charging a discount rate of 1 per cent higher to cover their costs and losses, making their discount rate 2 per cent., which is the wholesale cost of credit to the local Credit Associations such as the P. C. A. Neither Federal Land Bank bonds or Emergency Bank bonds are guaranteed by the government either as to principal or interest. They have back of them the sound securities of sound farmers, their reputation and intention to pay their debts, and the capital of these securities. It is quite apparent, I think, that if this system is going to work, it must have the confidence of the farmers and of the investors. These permanent organizations are set up on the co-operative plan. Every borrower or co-operative in these permanent units becomes a stockholder. He takes stock to the amount of about 5 per cent. of his loan. Through this stock he shares in the risk. So what we have here really is to furnish a working capital to help farmers help themselves establish a permanent system of credit.

That is something like the way in which the R. F. C. bought preferred stock in banks to help them become established upon a sound basis. The Federal Land Bank now has a capital of some $234,000,000, and $111,000,000 of that is owned by farmers through their Farm Loan Associations. This is about 48 per cent., nearly one-half of the capitalization which is owned by the farmers, and the amount is increasing. These banks were only established about two years ago,—taking all of the five hundred and sixty in the United States, with about $84,000,000 in capital, about $8,000,000 of that is owned by farmer borrowers which is about 10 per cent., and the proportion of the farmers in the credit associations is increasing,

and in the banks for co-operatives while most of the capital is meant for the farmer, but any borrower co-operative who has taken stock can secure a loan, and these now own from one and a half to two million dollars in the stock of the different banks for co-operatives. In this way farmers and their co-operatives have been given a chance to have their ownership in these institutions, to have them to use,—I hope not to abuse, and to operate for the welfare of Agriculture. You know it has been done once before under more difficult conditions than we face today. The Federal Land Bank idea was started back in 1917, and provided with $9,000,000, that capital was reduced as farmers took stock in these various Land Banks. It was not until 1932 that the Federal Land Bank came into its own to help carry through the depression. It was done once and it can be done again if it is worth while. I believe it is. I do not ask you to take my opinion for it.

Now, I would like to discuss some of the reasons why this sort of a system may be necessary in Agriculture. With improving conditions it is natural that the Farm Credit Administration should be challenged by private lending agencies, which have not been so active during the depression. These private agencies protest against the usurpation by the Farm Credit Association of their own particular field. These protests may be expected to increase in number and in force as conditions improve, and I think every organization of this sort that wants better conditions for the farmers must face that question and answer it,—as to whether a Farm Credit Administration is needed. I believe in answering that question consideration must be given not only to the desires of the lending agencies, but also to the needs of agriculture, the needs of the farmers and the farmer co-operatives. I would like to submit a few points that I think bear on this subject. First, agriculture requires terms of credit that are peculiar to the farming industry. I do not need to argue that point to a group like this. You know of the basis of your business, of the fact that the orderly processes of Nature cannot be hastened, and that while ordinary business can be conducted on a sixty or ninety day basis,—most of it cannot,—the farmers require six months, two years in some cases three years to finance the purchase of a farm or produce, and part of the purchase price has to be made under a mortgage. A long-term amortization mortgage is the only sound mortgage from the standpoint of both borrower and lender. The Farm Credit Administration obtains credit on terms that correspond to the needs of the farmer. I am very glad that our leadership is being followed by the private agencies. They are now offering long term mortgages for ten or fifteen years, some of which is on the amortization plan. That is a step in advance.

Second, Agriculture requires dependable sources of credit. I have no quarrel with private agencies, they lend when they want to lend and where they want to, and as they want to, but we have found from experience that in all of the regions some of the time and in some of the

regions all of the time that agriculture has not been cared for adequately by private agencies. That can be clearly demonstrated by anyone who takes the time to look the situation squarely in the face.

The job of the Farm Credit Administration, as I see it, then is to get funds wherever they are available at the lowest cost, and to make those funds available to all farmers with a basis for credit in all farming regions, and to offer the same quality of credit service to all types of agriculture.

There is another point that I think needs consideration. It is desirable, in fact it is almost necessary, to stabilize credit conditions in agriculture. All of us have suffered from too much credit at the wrong time. No one ever got out of debt by going into it. The policy that we are trying to follow in the making of mortgage loans is to make them of a valuation that can be sustained with the normal earning power of the farmer receiving the loan, taking into consideration the period for which the mortgage runs. We have been carrying out this policy during the period of depression. We have been lending mortgages upon a price level that would not be justified by conditions normally, and the moment we see that when and if and as we get into a period of unusual prosperity, we will have to lend on a more conservative basis, recognizing that the amount that can be safely loaned to a farmer depends not on price and value at the moment or the year that they want it but must extend over the period which the mortgage covers. That is the test.

I hope that we can have the support of all farm Associations in getting the broad recognition by farm people of the fact that too much credit does not do any lasting good to farmers. We are trying to operate production credit on what might be called a stabilized basis,—that is, in future lending the farmer what he requires when he has a basis for it, for the orderly operation of his farm, and avoiding the temptation that has been exercised in the past, of lending too much in good times and not enough in bad times.

I believe, further, that agriculture has need for credit at as low a cost as is consistent with business operation. You know lenders are mostly human beings, and they resist reductions in interest rates just like you and I resist reductions in things we have to sell, and borrowers being equally human would like to borrow at as low a cost as they can.

Now, the Farm Credit Administration is a borrowing organization, a collective borrowing institution for farmers. It is attempting to look at credit problems from the farmers' point of view of obtaining the best possible terms for the farmer as is needed in the orderly establishment of his business.

How to reduce the cost of credit was the first, the most important element for us to consider. Cost is what you have to pay to some investor,

to someone who is lending funds. The first point to be considered is to make sound loans and build a reputation for sound securities. The cost of making and collecting loans is a large item. In the Farm Credit Administration which is owned by farm borrowers, the cost of making and collecting loans is up to the farmers themselves. If you pay your debts promptly, without compulsion, we can save on those costs and we get the benefit. If you do not pay those debts promptly without compulsion then we have got to pay the collector legal and filing costs, and all that enters into the cost of credit. That was one large item in the cost. We succeeded in getting amendment of the laws in more than thirty-five States reducing the costs of filing chattel mortgages, and other costs in filing mortgages, which brought about a saving of a large sum of money for all the borrowers.

In a nut shell, this organization that we are trying to build, you and I, is one which borrows at the best possible business terms, and lends to us, the borrowers at as low a cost as possible, including the necessary overhead. Of course, when times are better, the interest rates may be higher. We do not make interest rates, but we do enable individual borrowers to get funds at the lowest possible cost for a sound security that is available anywhere in the United States. The present rate of the Federal Land Bank is 4 per cent., based on the 3 per cent. received from the bonds, and approximately 1 per cent. margin to cover costs and occasional losses. The Production Credit rate now is 5 per cent. based on a wholesale cost to the Production Credit Association of 2 per cent. and the margin of 3 per cent. If they can operate on less than a margin of 3 per cent., reserves will be established and the borrowers will get the benefit. I do not believe that farmers desire a continued subsidy. They do demand fair prices for their products, and fair interest rates.

They had a rather illuminating experience in Ireland. About 20 odd years ago, shortly after the turn of the century, the British Government bought and sold to tenants many of the estates owned by non-resident landlords, and they made those sales to tenants at a subsidized interest rate. They made those mortgages on terms of about sixty-eight years. The borrowers paid an interest rate of about 3 per cent. It varied in different years,—2¾ per cent. to 3½ per cent. on the principal. I had the opportunity of visiting that region in 1926. I found that at that time those farms that had been sold with those mortgages upon them were selling at a premium,—from $150.00 to $200 an acre. They were bringing a higher price than the ones with no mortgage. That was no permanent solution of the farm credit problem through subsidized rates.

So we are trying to provide credit for agriculture, believing that the individual needs for farmers for credit, while small, are as sound as are large businesses, and that farmers are entitled to credit at as low a rate as can be obtained in any other business. I am glad to see private

agencies returning to the field. I believe there is a place for both private and co-operative agencies. I believe they will supplement each other. I believe that farmers will be better served at lower cost if we have sound co-operative agencies, and also have privately owned agencies run on a high plane. I believe that will give better service and at a lower cost, and incidentally if we have private and co-operative agencies, the one that does the best job at the lowest cost will get the business. I am perfectly willing to have the Farm Credit Administration judged on such a basis.

I would like to emphasize a few points that I believe are important for us in building a permanent system of credit,—first, as to the point of view we in the Farm Credit Administration are trying to look at the credit proposition from the farmers' point of view,—how to meet those needs safely to the bank and with advantage to the borrower. We have nothing to sell, but a service to render. When a farmer is uncertain about the credit he wants,—whether on a long term or a short term loan, we are ready to help you to decide your financing to the best advantage of yourself, we have nothing to sell, we are only there for your service. That is true, the Farm Credit Administration and the other co-operative agencies are merely the hired men of the farmers. We are not anything else but specialized hired men, working for the best to the farmers. We want to keep the cost of this credit organization as low as possible, but it is a complex business administration. I have usually noticed that most people think of the employees of these various co-operatives, the Federal Farm Administration and others as Federal employees. There is only one Federal employee in the permanent organization, and that is the Registrar, he is the public officer with whom we pledge the mortgages. The employees of the Federal Land Bank are paid by the farmers, their salaries come out of the interest margin that we have to charge to cover the farmer's loan and interest in whole. They have been employed by that credit organization, not by the Federal Government. We need all of us, members and officers and employees to learn more about our job of working together. Education in farm credit means to me not high pressure selling, but telling the thoughtful farmers and farm women of the opportunities and responsibility of membership in co-operative credit institutions, the Land Bank and the Production Credit Corporation. Right now they are holding a series of annual meetings, only one in each locality. They are an important part of this education. Dr. Bomberger's associates would be here at this meeting but they had to go to a meeting of the P. C. A. At those meetings the members and others who go are told how those institutions operate, how they can be made to operate better, the importance of electing the best business people to represent you and me as directors in these institutions. It is highly important, we have got to learn a lot more than we now know, all of us, about credit,—perhaps not the people in this room, perhaps you already know, but in other States we need to know how to use credit wisely. It is a two-edged

sword, it can cut both ways. It is highly useful if it is used wisely, but highly dangerous if it is used unwisely. We want to learn how to build and maintain a good credit system in good years rather than to wait until times are bad to learn the need of credit.

In my judgment the Farm Credit Administration cannot be run from Washington nor from Baltimore entirely,—more and more the responsibility rests upon each locality. Now, we have got to learn to handle that responsibility before it can be wisely decentralized. Progress is being made, I think it is slow, but I believe it is sure. We now have five hundred and fifty production credit associations, but how big a territory should each of those cover? I do not know. I wish I knew somebody who did know. I can tell you in general terms what we are looking forward to doing, making the unit as small as possible, yet with enough business to provide a minimum cost for your membership, whether two or twenty Counties remains to be seen. I believe there are thirty-six in this area, but nothing is fixed. We need to have the most economic unit that we can provide and still maintain a good standard. We want to get the Farm Loan Association and the P. C. A. working together, but that all takes time, in some cases there are officers in the same town not working together. There is no excuse for that. Get them, together get acquainted and begin to work together. We have in the two credit associations about 15,000 folks working for farm credit interests, the biggest single job I have is promoting harmony and work among the people and the units in this organization. I know it can be done, but it is quite a job. We have got to build a production credit system that will include all the farm loan associations, we must get them together and together they can provide the credit needs for farmers on a sound basis. There are more than 800,000 individual farmers who are member borrowers of the Land Bank and the Production Credit System. That is quite a job to get them educated to know of the problems and the policies of running these institutions. It is the most important single part of our program.

Well, cheer up, it is almost over. Today is bright, brighter than yesterday. The skies have been brightening in our work just as the skies have been brightening overhead during the past day. We are fortunate in having made substantial improvement in farm production, farm morale. Real estate values are better, I know it, you cannot deny it because the acid test of improvement is in collections. There has been a splendid increase in collections in all of the units of the Farm Credit Administration in the past two years and especially the past year. The policy we have followed consistently through those years has been to extend to borrowers as much latitude as we could, not to force them too much. Out of some $800,000,000 in Land Bank Commissioner's loans in that period all of the interest payments up to November 30th had been paid up to 85 per cent., leaving only 15 per cent. unpaid. You can hold up your heads and strut a little in this district,—93 per cent. of all of the Land

Bank Credit interest has been paid up to November 30th on those loans, and no principal payments were required for the first three years, but $14,000,000 had been paid on principal only on a little over $800,000,000. Over $7,000,000 paid in full, the other deferred payments not due. Through the latter hours of depression we have tried to found the policy of the Farm Credit Administration on a sound basis that farmers would pay their debts if they could, and they are doing it

We have a good outlook for the near future. You have the Farm Credit Administration,—an imperfect administration, nobody knows that better than I do,—you men may think so, but I know a lot of things that we are doing to correct those imperfections. That is a thing for which this Farm Credit Administration has been workng, to give credit equality for farmers. We have done it. Is it worth preserving? In my judgment the way to preserve it is to strengthen the co-operative feature, to recognize the fact that it is not a Federal institution, that it is really owned by the farmers. We have the opportunity to own it. We do not yet own it, it is only partly paid for. This country needs a Farm Credit Administration suited to the needs of agriculture. The real question is how are we going to have it. Do we want a farm credit administration with conflicting interests, or on a co-operative system with a sound business basis?

We are trying to do this job to assist in establishing an administration with sound business basis. We meet competition in this. We need your co-operation, we need your criticism,—I hope it can be constructive criticism, but if not, give it to us anyway. We are trying to make this system as sound as it can be made. Ladies and gentlemen, the job can be done, I believe, and then one problem will be on the way toward solution, —the solution of the credit problem, and then the Farm Credit Administration can continue and will continue to the better country life, to a higher standard of rural civilization, if we will all get together and do our best.

MR. WEAGLEY: I am sure you will all join me in expressing our thanks to Govenor Myers for adding to our program this afternoon. We will now have some songs.

MR. WEAGLEY: Coming now to the part on the program that I feel is an honor to me from my home County, Washington County, I am able to present a boy from our County, a Farm Bureau boy, who has been elected to the highest degree obtainable to any boy as a Future Farmer of America. It is a privilege for me to be able to present to you at this time, Carroll Miller.

CARROLL MILLER: Mr. Chairman, Farm Bureau members; A few days ago I read in our local paper an account of what I am about to say this afternoon. This account was to the effect that a young speaker was to

appear on the Farm Bureau program this afternoon. I assure you that I agree that it is a privilege, and I am glad that I am permitted to be here.

Do not begin with the idea that the Future Farmers of America is only a National organization. It covers the whole of the United States and the Hawaiian Islands. Some of you will think that because the Hawaiian Islands are so distant from the mainland they are not very active. I can assure you that they are. The past summer they not only financed the trips of the National President and the National Executive Secretary to the National Convention in Kansas City, they also sent two delegates.

The Future Farmers of America organization is an organization which is doing much to better prepare the farm boys for their life's work. Agriculture is taught in the high schools, each high school that teaches it features agriculture, vocational agriculture. It is the privilege of those students to participate in certain State and National affairs. Each year there are degrees which may be received by members of the organization. The first two years the degrees are given by the local chapters. These degrees are the degree of "Green Hand," the degree of "Future Farmer." The third degree may be conferred only by the State organization. That is the degree of "State Farmer." The National degree may be conferred only by the National organization. It was my privilege to receive the degree of State Farmer in my junior year in High School, and the degree of American Farmer the past October in Kansas City, Missouri.

It is also the object of the Future Farmers of America to not only teach the boys in High School, but to help them in their work on the farms. To do this each boy who takes an agricultural course must carry some home project. The first two years of agriculture, the subject which is taught is either that of animal husbandry or plant husbandry, and during these two years the projects which are carried must correspond to the subject being taught. The farm Bureau has encouraged these projects by issuing and granting medals to the winners in the State Project Contest. When I entered High School in 1931, as freshman, I carried as my first project five acres of corn. The second year I carried two projects, one of sheep and one of poultry. On the sheep project I won a third prize medal at the Farm Bureau Convention here. My third year in High School I carried one project, that of dairy. I won on that project the first prize medal given on this subject for the Philadelphia Milk Shed. In my fourth year I carried one on sheep and one on poultry. I was granted a first prize medal on my sheep project, and the second prize medal on my poultry project.

There are various offices in this organization that correspond to offices in most organizations, local, State and National offices. In my Junior year I was Secretary of the local organization; in my second year I was Treasurer of the local and also treasurer of the State organization.

The thought which I wish to leave with you this afternoon seems best illustrated by a little story told at our National Convention by the first Vice-President,—a story of a man who ran a sawmill, and he had a little dog. One day when he was sawing this little dog ran around the mill and caught the end of its tail in the mill and it was severed from his body. This grieved the owner of the little dog very much. He picked up the end of the tail and took it back a ways from the mill and buried it. A little later the little dog came up to him with the end of his tail in his mouth. This worried the man very much. He took the tail again and carried it back farther, and buried it deeper. A short time later up came the little dog again with his tail in his mouth. By this time the owner of the little dog was greatly worried, he could not understand the actions of his dog, so he took the tail again and took it even further from the mill and buried it deeper than before and covered the place with stone. For a while he did not see anything of the little dog, but towards evening he noticed his little dog coming down across the field, and between his teeth he had his tail, and he laid the tip of his tail at his master's feet. He was faithful to the end!

MR. WEAGLEY: I am sure you will all forgive Carroll for speaking personally about himself. It was the only way he could tell you what he had accomplished. At first, he did not want to speak, but we told him it was all right, and that was the only way he could express to you what he has accomplished.

Next on our program we go over to the State of Pennsylvania to get a lady who is a stranger to you up until this morning's meeting, but last year at our annual meeting in Washington County we had the President of the Pennsylvania Farm Bureau with us,—Mr. Benjamin, and I feel sure that I can recommend to you the lady that we have this afternoon who is with the Pennsylvania Farm Bureau, Mrs. Verna Hatch, who will speak to us on "The Farm Woman's Part in Cooperation."

THE FARM WOMAN'S PART IN COOPERATION

By MRS. VERNA HATCH

The thing that impressed me most this afternoon was the fact that we have a young man coming before this Convention, appear on this platform, to tell us about the Future Farmers of America. I think if there is any one more important thing in any program we have with reference to our future than any other it is this thing of making our Farm Bureaus so attractive to our young people, and rendering them such services, helping to educate them to help themselves. The interest, the rate of interest in the youth of today has been increased 2800 per cent. since Theodore Roosevelt by the fact that we have permitted them to work with us. I was impressed with two points brought out in your program,—first in cooperation they aim to help farmers to help themselves; and second, to learn more about the job of working together.

So, when speaking of the farm woman's part in this program, I want to bring to you the message of cooperation. After I was invited to go into Pennsylvania to help in our cooperative movement I spent a great deal of time contacting various agencies in that State, trying to discover what sort of agencies could work together and cooperate. I talked to the women with reference to cooperating as producers and in marketing. I attempted to bring to them a picture of a unit,—I pictured something of the things we were doing in our own home, to have each member of the family a part through cooperation of that unit. In our home in Allen County, Indiana, we have been able to solve problems that just a few years ago seemed impossible to solve. We discovered new ways in which living out on the farm might be improved, ways in which we might cooperate, so that anything we did might fit in with our neighbor's needs. In other words, what we did in our family unit might be extended to the community, to the State, or even to the Nation. If we can get a picture to our people of progressive cooperation, get them to where they feel their obligations to their community as to their families, we will do much.

Then, we can take up the viewpoint of world brotherhood. I remember at the time of my coming over to begin this piece of work in Pennsylvania, the news was filled with items about the race on between war and education, as to whether the world as such was ready for war. H. G. Wells wrote about the race between war and education. When he came to America some one met him at the train and asked him "How about the race between war and education?" and he said "There is not any race any more, just plain war." Is there any way that this world can save itself from war? Even on down to November when the entire world on the day of the Armistice took off their hats and stood in memory of those who died to make the world free from war,—the whole world stood still for two minutes, and then seemed to go right back to the mak-

ing of more war material as the world seemingly moves toward this matter of strife. At that time there seemed to be one man in this whole world with sufficient power to hold the peace of the world at the point of a bayonet. During those weeks we all wondered just what might come about because of this tragic thing. Those were the things I thought of when I was asked to speak this afternoon,—what message I might bring to you.

The picture came to my mind inadvertently of my little book in which I registered meetings and dates that I want to remember, and I thought of what I might say to you. I am not nearly so pessimistic now as I was, I am not sure but what the movement of Christianity about which Dr. Kagawa is talking to us,—practical Christianity, Christian economics may yet save our world from war. If we have a plan of everybody working, helping to make everybody work on the plan of cooperation, to really know what it means, we may do much to help the situation.

Just a short time ago I went to the Farm Bureau Convention in Chicago, never in the history of Farm Bureau work have I been so marvelously impressed with the great dynamo of energy, the high purpose, the power that was carrying us towards cooperation. The things I heard there and the plans suggested again in this matter of education, making it possible to get people to work together as in your own home, discussing various policies that need to be worked out.

That people understand the cooperative movement and what it might do for them years ago was shown when there came into the picture of the world a man known as Godly man,—a Christlike man,—Gandhi,—who set up thousands of cooperative movements, clubs, groups of people, teaching them to think for themselves, to work together each for the other.

There is a man from Japan, Dr. Kagawa, who is telling the story of cooperation in Japan,—fully one-third of the people living in Japan today have learned the cooperative way of living, cooperative welfare. Dr. Kagawa blames the lack of creative labor, love and devotion for the present social and economic problems of the world. What we need is an industrial democracy as well as a social democracy.

I went up to Buck Hill Falls this same year and saw there a collection of the peace leaders of America. I saw there a collection of educators, of representatives from foreign countries, and from our country from California to Maine, talking about peace in terms of what sort of peace was needed. I learned there from the men who spoke with authority, that a great majority of the people will not, cannot look forward to a promise of security; they must have adequate income, and be able to use that income in a way that will go the furthest. All of these things have their part in this great movement of cooperation. When a State Farm Bureau accepts that movement, and goes out to take care of it,—that thing

is going to spread and spread until it can cover the whole world. What we want to do first is to help people to get together to help themselves.

At the Peace meeting of the leaders of the Nations that gathered at Geneva, all the youth of the world were interested. One young man carried a petition with 800,000 names on it, challenging those people there to do something for the youth of the world. The cooperative movement can provide something for youth today. Our farmers, men and women, all of us need to learn, and we will start out and plan a program to make it possible to solve many of the problems of today,—we can solve our own industrial problems, we have within the membership of the great cooperative movement sufficient if we work together to solve the problem of unemployment.

We want to look forward to the day when we will take care of health instead of sickness, provide medical care to keep us well rather than to take care of us after we are sick.

I spoke of having our young people employed, to give them opportunities to learn what cooperation means. They must learn to work together, get up their own clubs, the girls working together, the boys working together as the young speaker today told us,—teach them craftsmanship, this idea of getting together in industry, instead of finding them waiting outside of factories, taking humble things and turning them to good causes, bring those things together.

Now, why has this cooperative movement not succeeded better? Because we have not proceeded with proper educational foundation. As people grow, develop leadership based upon real ability, cooperation will solve many of our real problems. I stood on the sidewalk to buy a paper, and while waiting for the paper, I heard a young man say "I would rather be dead than broke another day." We must try to organize small groups, ten or more, to be responsible for other groups, and set up our own system of education which will not only enrich ourselves, but give us the joy of doing something for the success of others,—we want to help clear up the world for them.

I will just say in closing, if we can do this by organizing our own little community, set up our own little groups, encourage them to be associated in cooperative activities, whether it be the end of a long day that we have gone out and organized a group, handled that matter of getting them together, whether it comes in the sunset of our life we can be assured that we have done much to bring about the peace that the world needs.

MR. WEAGLEY: I am going to ask our Secretary to present the next speaker.

MR. WISE: Mr. Chairman, when I met the train this morning I failed to see Mr. Lincoln. When I asked for him I found that Mr. Lincoln was

worn out; had been ordered to stay home. We were fortunate, however, in securing Mr. Joe Porter, of Tennessee, who has been in conference in Washington, talking over these most recent problems that have come up there. I have the pleasure of presenting to you Mr. J. F. Porter, of Tennessee.

MR. PORTER: Mr. Chairman, ladies and gentlemen: It is a very great pleasure for me to meet with the Maryland Farm Bureau over here. I was over here a year ago for a short time, and I observed the wonderful type of people that you have. So I was delighted to have the opportunity to come today. Mr. O'Neal spoke to me this morning and handed me his ticket, and started me over. I like to associate with other Farm Bureau folks, I like to observe their activities.

However, I am a very poor substitute for Mr. Lincoln. He is an educated man, a university man. I never had the opportunity, did not take advantage of what opportunities I had. I will have to just say to you what a dirt farmer would say under the circumstances we have now.

I do not know that I have experienced a time in my fifteen years in Farm Bureau work in which there was more difficulty for one to keep his feet on the ground, not to get upset. You may imagine how I feel after a week in Washington, listening to them there. I have a great temptation to go right back to my farm and stay there. I have a farm at home that is paid for, and it would be a great pleasure for me to go there and settle down. But on a more careful consideration that would be a foolish thing for me to do. That is the trouble with the farmer today. We are too close to the soil, we work too hard to produce what we need. As our great President of the Farm Bureau says,—he is a Presbyterian and can cuss, a Presbyterian, he knows it and he don't have to worry what happens,—if I could cuss as well as he can I would join the Presbyterian Church. President O'Neal says "we farmer folks have worked our damn fool selves to death." Sometimes I think that is so.

After I learned a few minutes ago that I was to make this talk to you, I jotted down a few things that I thought might be of interest to you. It occurs to me just now requires the greatest statesmanship, the greatest Christian forebearance, that I have ever known. I do not believe that the greatest statesmanship comes from party leaders, I think it comes from men of high principles. I have been reading what Dr. Kagawa says about the divorce of Christian principles from everyday life in the world today. I do not believe the greatest statesmanship comes from party leaders. It is true we have to have parties, but I like to think of a man who holds himself above parties, who thinks that things are right not because of his party pledges but because he really believes they are right.

You know I had always been taught in my early childhood to have very great reverence for the President of the United States. I was taught

to think that when a man became President of the United States he occupied a very great position and I must be careful not to speak disrespectfully of him. I learned something different about that during the war, when our great President Wilson was so greatly criticized. I am a Democrat, but whether Democrat or Republican my idea would be the same as to that. I heard a man make remarks about President Wilson that I did not like, and then on down through the Coolidge Administration we got used to hearing jokes about him. But I still held a great reverence for the Supreme Court. I thought that a man who would criticize the Supreme Court was guilty of high treason; he was taking a very great chance. I felt that up until last week, but over in Washington this week I have been in meetings where I have heard some of the greatest men in this country speak very freely in their criticism of the Supreme Court. I won't give names, but this was at the farmers' conference in which every leading farmer is represented. I say that I heard one of the best minds in the United States make a statement that it was rather remarkable that in a Congress like ours composed mostly of lawyers that they should attempt to write a law thinking they were within the Constitution, and six out of nine of the Supreme Court could throw all that out. He just talked about the members of the Supreme Court like they were everyday people.

That reminded me of a little town where the Missionary Society, the women were all excited about the way their husbands were behaving. That is the difference between men and women. Men talk about things and women talk about folks. Well, they were disturbed and they went to the preacher, and asked him if he would not speak on the subject of better husbands. He finally agreed to do it. He made it public that he would preach on that subject, and so on Sunday the church was well filled, mostly by women, but there were a few men present. He got up and gave out his text, and he started to preach his sermon. He said in the early days of his childhood he remembered his father and mother lived together very happily, he remembered when his father came in at night mother brought him his slippers. He said his mother watched over his father all the time, looked after him like he was a child, brought him his paper, fixed his pipe for him. "So," says the preacher, "after giving much thought to the way my father and mother lived together, my mother always looking after my father, mothering him, and my father was always a good husband to her. And so, ladies and gentlemen, I have come to the belief that that is the thing to do, and I believe that the real difficulty today is with the women themselves, and I do recommend you go back to the old principles of mothering your husband." All the women sat quiet, they did not think much of that. When the preacher finished his sermon, he said "Now, my friends, what we want is a practical example. How many folks here in this audience this morning for the next six months will do what I have been preaching about, mother

your husband?" Everything was silent for a few minutes. "Can it be possible that a large group of women like this audience does not contain one noble sister who will undertake to carry out this example?" Finally one old sister held up her hand. "Thank you, sister, come right up here and tell us how you are going to carry out this plan of mothering your husband." She held back for a while but finally she walked right up to the pulpit. The preacher shook hands with her, and he says "My brethren, we are thankful to have one sister in this large group of women who will carry out my plan. Now, sister, tell the audience how you expect to mother your husband." She held her hand back of her ear and says "What did you say?" "I said tell the congregation how you expect to mother your husband." "Oh" she says, "I beg your pardon, I thought you said smother him."

Now, of course, you cannot smother the Supreme Court. I would like to try to bring you some thought of what is happening in Washington.

Perhaps you know of the seven points. The greatest piece of legislation this country has ever seen in my judgment for agriculture has been lost. I do not say that with any fear of contradiction. I believe forty or fifty years from now we will wonder why anybody ever questioned the propriety of a directed production. It is a reasonable thing. We should have intelligently directed production. The processing tax is just a tax. Mr. Wallace called together seventy or seveny-five farm leaders in the Nation for frank talking. He said to us, called us together to consider the situation, told us to elect our own chairman, and follow our own lines of discussion. This was done, Mr. Bill Settle was made Chairman, and recognizing the importance of the occasion, we elected thirteen men representing thirteen different States in agriculture to formulate a plan on which we might be able to reform new legislation. This is done,—now under the ruling of the Supreme Court it is not easy to formulate new legislation. You know it is easy to imagine you are going to do those things, easy to listen to people talk about a plan, but not so easy to carry it out. I will tell you another story that I think of. An old man and his wife down South, very nice people, but very fond of going to the circus. They went every fall when the circus came to town. They had to give it up during the depression, but when the New Deal came in they had a little more money, so when Ringling Brothers came down there, they decided to go. They got their tickets and they went in and took their seats. In the center of this show there was a lion, the lion trainer was in the cage, as you have often seen with his whip in his hand, and he makes the lion jump through a hoop. Well, when he got through, they brought a beautiful young girl into the cage, eighteen or twenty years old, and she was given the whip, and she went to work on the old lion to make him do his tricks. The old lion growled and growled, but he finally did what she wanted. She made him come up and take some sugar that she had placed between her lips. That was too much for the old woman. She

nudged her husband, she says "John, that is the most remarkable thing I have ever seen in my life." The old man sat there with indifference. She says "Don't you think that is the most wonderful thing you have ever seen?" The old man says "I don't see anything so remarkable about it." She says "Well, you can't do it." He says "Well, I might try it if you take that old lion out of there,—then I will try it."

Now my time is almost up. I am awfully glad to have visited with you. There are just a few things, as I see it, that are the important matters before our conference,—intelligent direction of production,—no matter what else happens, we must think of that; liberalized Rural Credit; transportation; land use; safety highways; rural electrification; world peace. Those are the seven points we have been considering, the points recommended by the Committee of Thirteen. They are holding conferences trying to figure on some further propositions to recommend.

We do not have much rural electrification in Tennessee. We do want electricity and want it bad. We do not want to lose our present position, and just because it has been slipping in the last few days don't think it is lost. We are doing all we can to save it.

The State of Maryland is in the Southern region while you live more or less in the East. I want you to know that I feel very near to you, because I used to know an old man,—his name was Dorsey or Dorsett, and he came from Anne Arundel County,—he used to tell me a lot about Maryland, his early days in Maryland, and I felt very near to you.

I hope all of us farm people will stick together and not let anything divide us.

MR. WEAGLEY: Thank you, Mr. Porter, for appearing on our program this afternoon. We appreciate the information you have given us.

The meeting thereupon adjourned 4.25.

FRIDAY MORNING, JANUARY 17

Mr. Nuttle presiding.

Roll call by Credentials Committee Chairman, and seating of delegates was the first order of business.

Mr. Wise thereupon read the report of the Nominating Committee as follows:

The report of your Board of Directors acting as nominating committee is as follows:

For President—H. H. Nuttle.
For Vice-President—Wilbert L. Smith.

Nominating committee having nominated Mr. Nuttle for President, Mr. Charles T. Cockey, Jr., took the chair, and called for other nominations from the floor.

Mr. Boley moved the nominations be closed, and Mr. Phillips of Wicomico County, seconded the motion, which was carried.

MR. NUTTLE: I feel deeply the honor you have conferred upon me. I do not think there is any chance of my getting a swelled head. My responsibilities will take that out of me. There are a dozen or fifteen or even twenty-five men in this audience who could fill this job and do it better than I can. I feel honored and I assure you I will give the best that I have. You have certainly cooperated with me in the past, and I hope you will continue. We are building the best Farm Bureau that Maryland has ever had. We have a big year before us.

The Nominating Committee had named Mr. Wilbert Smith as Vice-President, and Mr. John Smith moved the nominations be closed. Mr. P. C. Turner seconded the motion and it was carried.

The Secretary, Mr. Wise, was authorized to cast the vote.

I cast the ballot for H. H. Nuttle for president and Wilbert L. Smith for vice-president.

MR. SMITH: Mr. President, ladies and gentlemen, you know I will have to tell you the same thing that Harry Nuttle told you when he was elected Vice-President,—I am only a spare tire. I have a lot of esteem for your President who is occupying the office today. I had a lot of esteem for the man who preceded him. I certainly hope that Harry Nuttle does not do the thing to me that President Cockey did do him, but that is one good thing, ladies and gentlemen, as evidenced by this Convention,—when the spare tire was to be used it was not flat.

The only thing I can say this morning,—I am going to quit in just a

minute,—is that I realize the high honor which has been conferred upon me by you gentlemen and ladies. At the same time, I realize the importance of the office, of any office in this organization. I have been 100 per cent. behind the organization ever since I have been a member. I hope to continue in that spirit. I realize the responsibility that devolves upon an officer in this organization and, with your assistance and cooperation, I think I can count upon that, the job will be much easier, and we will make good. I promise you my cooperation.

Next on the program was the report of the Resolutions Committee, Mr. Smith, Chairman.

MR. NUTTLE: How will you consider that report, one by one?

Mr. Linton moved that they be taken up one by one, and Mr. C. C. Phillips seconded the motion, which was carried.

MR. SMITH: Mr. President, ladies and gentlemen; The Resolutions Committee begs to report the following resolutions, and we have two more resolutions that have come in since we had a chance to have a meeting with the committee. These two resolutions came in last night and we did not have a chance to have the committee meet, but I got in touch with most of the members of the committee. I think we will present these two resolutions first before we take up the list that is printed.

Thereupon a resolution presented by the Vegetable Growers' Association was presented. Mr. Turner moved it be adopted, and Mr. Linton seconded the motion.

MR. NUTTLE: I do not believe that resolution is in the proper form for this Association to pass it. It seems to me the thing to do is to have it redrafted. (Thereupon Mr. Nuttle appointed Dr. Symons and Mr. Turner to put the resolution in proper shape to be considered later.) This recommendation as amended was later brought in and duly adopted. It is appended hereto.

Monetary resolution read—adoption moved by Chairman Smith, duly seconded, and carried.

MR. COCKEY: I would like to suggest that our chairman in presenting these resolutions move that they be adopted. Then they will only need a second.

Thereupon "Report of Resolutions Committee" was presented, the chairman of the resolutions moving the adoption of each resolution as presented, and Mr. Linton seconded the motion and it was adopted.

"Farm Credit" was presented, and seconded by Mr. Jones, of Montgomery County.

MR. JONES: Don't you think there will be some change in the prop-

erty in the course of several years? That would be the only objection that I see. I offer that as a suggestion merely, not as a criticism.

MR. SMITH: I think, Mr. Jones, in that respect, the reason it was written that way is that we want to get away from the inspection cost as much as possible in subsequent loans being made, so that instead of making a complete new inspection, it may be done by some officer of the bank.

MR. NUTTLE: I happen to be Vice-President of an organization where we are doing that. As I see it, your point is pretty well taken. We are not advocating that they do not inspect the second time. They have already adopted that practice in our Association. Do you want to make an amendment to strike out that paragraph?

MR. JONES: I do not know that an amendment is necessary; it seems to be taken care of in the next paragraph.

Resolution adopted.

"Public Safety" was presented, seconded by Mr. F. Schillinger, of Talbot County, and adopted.

"Taxation, etc." was presented, seconded by Mr. P. C. Turner.

MR. NUTTLE: My impression of that emergency gross receipts tax is that it would only be a temporary tax until the State Tax would be available. We are not advocating that as a permanent policy, just until the income State tax would be available. This is merely temporary. Resolution adopted.

"Legislative Economy Committees" was presented, seconded by Mr. C. T. Cockey, Jr., and adopted.

"Land Use" was presented, seconded by Mr. L. O. Jarrell, and adopted.

"Truck Marketing" was presented, seconded by Mr. William Duvall, of Prince George's, and adopted.

"Can Price Investigation" was presented, seconded by Mr. R. Blackburn.

MR. NUTTLE: At our National Convention at Chicago I presented this to our Resolutions Committee out there. They did not bring it out in their report, but it was presented from the floor and adopted, a similar resolution. That is part of the National resolutions. The price of cans is so high that it means you farmers get less for your crops than you would if you got them for a reasonable price. Resolution adopted.

"Extension Appropriations" was presented, seconded by Mr. E. C. Speaks, of Frederick County, and adopted.

"Japanese Beetle" was presented, seconded by Mr. P. C. Turner, and adopted.

MR. NUTTLE: You only have to travel in Cecil County to see what that beetle is doing.

"Weed Control" was presented, seconded by Mr. Johns, of Carroll County.

MR. BOLEY: I thought that was already a State law.

MR. SMITH: This is just to appoint a committee to go talk to the State Roads Commission.

MR. FUNK: I would like to commend that resolution. It is good. You know a few years ago the Legislature saw fit to pass a law to make the farmer get a permit to cut his trees. It struck the farmers of our County very hard. We thought it was pretty hard to have to get a permit to cut our own trees. I had a few trees on the road, and before I could cut them I had to write to the University of Maryland to get a permit to cut those trees. If the State is going to insist that we farmers, through whose lands the roads run, and who pay taxes on the roads, have to get a permit to cut our trees, I think the State Roads Commission better cut the weeds. I like to see clean roads as well as anybody. I do not like to see the farmers be the goat all the time. Resolution adopted.

"Gas Tax Diversion" was presented, and seconded by Mr. C. T. Cockey, Jr.

MR. WISE: I did not see this resolution. It recommends the payment of any outstanding State highway obligations. It would prevent any new ones. I would suggest saying "debt service" and I suggest that change in the wording.

MR. NUTTLE: Will some one make a motion to strike out the words "the payment of outstanding State highway obligations" and the substitution of the words "debt service?"

Mr. P. C. Turner made the motion, and Mr. E. C. Speaks seconded it. The same substitution was made in the second paragraph and the resolution adopted.

"Rural Electrification" was presented, seconded by Mr. F. Schillinger, and adopted.

"Farm to Market Roads" was presented, seconded by Mr. A. D. Miller, and adopted.

"Relief" was presented.

MR. PIERCE: I happen to be in Baltimore County, and the W. P. A. is not able to put any local men to work other than those on relief.

MR. NUTTLE: We want to get action on that. We have not been able to get any.

DR. SYMONS: Mr. Gray says that is not continued, if relief workers are not available, they can take other employees, including farmers and others. They told me from Washington that is not a requirement any longer.

MR. NUTTLE: They have been holding us down to it.

DR. SYMONS: They are very anxious for the program to go forward. They want to push these developments.

MR. LINTON: I would like that information to go down in Charles County. We do not have enough people on the relief rolls, to take care of our work.

MR. NUTTLE: The thing to do is to go back home and spread that. In my County the County Commissioners do not have much to do with the roads any more.

MR. JOHN SMITH: Everybody knows nothing and what can be done? In our locality a piece of road was to be fixed, and they went to work,—down in the Seventh District, about the first to the 15th of December, dug up a ditch and left it there until April. The farmers had to haul some brush to fill it up to get out on that road. This body should take some action as to that.

Mr. L. Jarrell, of Caroline County, seconded the resolution and it was adopted.

(At this point some lady rose from the audience and asked about oysters).

MR. NUTTLE: That is one phase of the relief problem.

MR. LINTON: What do you mean "partial payment of local taxes for relief?"

MR. NUTTLE: The Counties contribute some of the relief.

MR. HARVEY: Have you any agreement with the County Commissioners that this money should be used in this way?

MR. NUTTLE: You all misunderstand. The Counties pay a part of the relief and the State part. We have a local sentiment against paying too much relief. We have too much now.

MR. D. B. MCDOWELL, of Cecil County: Does our County have to pay for the Chesapeake and Delaware Canal?

MR. NUTTLE: The Counties are assessed for relief. We are thinking of the County unemployment problem. The Canal is a Federal project.

"Grades and Standards" was presented, and seconded by Mr. Linton, of Charles County.

MR. S. TODD: I think that should be extended a little further.

MR. SMITH: This resolution came from the Vegetable Growers. I do not remember the exact authority of the resolution, but I do know what they are trying to do is to be sure that when a man purchases a quality of goods he gets that quality.

MR. FUNK: This is a very important resolution. We have not heard of it until just a few minutes ago. We cannot get the sense of the last sentence. We want to pass a law. What is the use of that word "voluntary"? Some of us made a trip down to the produce market, got up early, we wanted to see how it was going. We find a condition prevalent in Maryland for years and years. Way back in 1924-5 we tried to get some laws passed with regard to fruits and vegetables in closed packages, get some standard. We find a demoralized condition in the fruit industry particularly. A man will rig up a basket of apples, and run in most anything, and that is sold mostly on the appearance of the basket right in competition with our packing house project using No. 1 inspection and grade. We are just about helpless with this situation. I do not like that word "voluntary" in there. There is not going to be any voluntary action, you can depend upon that. Since 1915, when we had our first packing law, we have been packing apples according to the grade requirement. You either have to have this thing compulsory or not at all. The open package people don't care, but in closed packages there is that requirement. This resolution is not workable.

DR. SYMONS: A resolution was passed last year. It was the intention of the committee to reiterate that resolution in the present resolution today. Of course, it would be fine if we could regulate and make mandatory the grading of all of our farm products now. I am not averse to that. On the other hand, we are going right far when we say we want to force grades and standards on anyone whether he wishes it or not. I am perfectly willing to suggest it, if Mr. Funk wishes it, that we recommend the passage of the same resolution passed last year. I think that was for the State Board of Agriculture to issue such rules and regulations as the respective growers want. That bill has been introduced in times past and it has been defeated by certain interests in the State, not the farmers, and what is needed is a general, all-around bill giving power to issue rules and regulations and save the farm products, that will have teeth in it and will be reasonable and fair to the particular producer that is affected. We can offer again the brief resolution we had last year.

MR. NUTTLE: Will Mr. Funk accept that?

MR. FUNK: I think that is a much better resolution than this one

here. If you leave out the last sentence this resolution is all right. That is the contradictory part of it.

MR. SMITH: I think the purpose of that sentence was this. We feel that if the people interested in a good quality product will help us until we can get this bill passed, use every effort to try to get people to co-operate in getting a good produce, we would have a better chance.

MR. FUNK: I agree with that, Mr. Smith, but I have been a man who has been trying to educate growers for some years, they are very hard to educate. I just do not like the word "voluntary."

MR. CAPET: I do not know who wrote the word "voluntary" in there. I think perhaps the substitution mentioned by Dr. Symons would be all right, but I would like to call attention to the fact that when you talk to farmers about grades and tell them there is a law that tells them they shall or shall not instead of using the word "voluntary" that leaves him no choice. That word "voluntary" at least lets him think he has something to say about it. The closed package law is a special legislation. I am strongly of the opinion that this word "voluntary" adds to this resolution, and that the resolution is much improved by it.

MR. FUNK: I do not want to hold up the meeting. I know that resolutions do not mean a great deal after all. It is just a bit of psychology. We can work just hard doing our missionary work in order to get a proper measure, giving the State Board of Agriculture the proper powers. I remember in 1925 we had a bill in the Legislature to get some proper regulation for packing fruits, and we had the bill on the go, it was going very fine. It happened unfortunately for Washington County we had one delegate playing both sides against the middle, passing himself off as a fruit grower on the one hand, and also on the other side. We will have to be very careful when our measure does get to the Assembly to follow it up to the end. I will go along with the measure and work for it when it comes up.

Resolution adopted.

"Tobacco Products Tax" was presented, seconded by Mr. Sam Linton, and adopted.

"Farm Bureau Program" was presented, seconded by Mr. Claude E. Phillips, and adopted.

"Liquor Control" was presented, seconded by Mr. Robert R. McCann, and adopted. It was suggested that an amendment be made inter-lining "and until six o'clock Monday morning" after the words "Sabbath Day." This amendment was carried.

"Truck Fruits Sales" was presented, and seconded by Mr. Connick of Prince George, and adopted.

"National Agricultural Policy" was presented, seconded by Mr. Fred Duvall, and adopted.

"Processing Taxes" was presented, seconded by Mr. Linton, and adopted.

"Interest Rates" was presented.

QUESTION: What does that word "conform" mean?

MR. SMITH: We find some of the banks are paying 2 per cent. interest, some 4 per cent., some charging 6 per cent., some 5 per cent. to the borrowers.

DR. SYMONS: We cannot expect the banks to operate at a loss. We have a State law allowing 6 per cent. on loans and some of the banks have reduced that to 5 per cent. We cannot regulate what they may pay for their deposits. I do not think they can get money for 2 or 2½ per cent.

MR. NUTTLE: How about changing that word "conform?"

DR. SYMONS: We substitute "be reduced in proportion."

MR. COCKEY: I move that this motion be left on the table.

Mr. Jones, of Montgomery County, seconded Mr. Cockey's motion.

MR. COCKEY: I will explain my motion. No bank can exist if they have to pay as much interest as they get from the borrower.

MR. NUTTLE: There is some misconception here. There was no idea on the part of the committee that the banks should pay the same interest on deposits as they are getting from the borrowers.

MR. ENSOR: It seems to me that we are holding ourselves open to a great deal of criticism if we pass this resolution. Some of the banks in the State are paying 4 per cent. and some only 2 per cent.; in fact, the Federal Reserve cannot pay over 2½ per cent.; some State banks are doing that. Mr. Myers talked about borrowing money for 1 per cent. and loaning it to the borrower for 5 per cent. In fact, the P. C. A. is paying 2 per cent. and loaning it out for 5 per cent. In other words, the difference between 2 per cent. and 5 per cent. does not pay its overhead. It occurs to me, speaking from the other end, that we have just recently been through a financial embarrassment which affected 90 per cent. of the banks, and not all of them have been opened up yet. I do not believe that any of the banks can operate unless they have a spread of 3 per cent. or 4 per cent. I happen to be an officer of a small bank, and they can only pay 2½ per cent. on savings and charge their borrowers 6 per cent. It seems to me that this resolution brings up the thought that perhaps the borrower is paying too much money. But you will find your small banks cannot operate at a lesser spread. That has been our trouble in

the past, paying 4½ per cent. on savings and loaning money at 6 per cent.; that has been the cause of so many failures in the past. I for one would regret to see this body pass this resolution.

MR. FOGLE, JR.: From what I can understand the resolution is practically impossible the way it is written. I understand that some of the banks do not pay any interest at all,—well, then they could not lend out their money the same way. The borrower would get his money for nothing.

MR. JONES: May I say that my thought when this resolution came before the committee was that it was to apply to our Federal loans. It seems to me that if we do anything of this kind, when we consider we have to go into this depositors' insurance, we will just be closing up any number of banks and the banks that did stand would have to pay the losses incurred. I object personally to that depositors' insurance for the reason that it permits a lot of banks to run on shoestrings. It is a very dangerous proposition from the standpoint of the banks in the State. Of course, I am in favor of the farmer getting his money at the lowest possible rate, but I happen to be connected with a small bank, and I see the matter from the other side also.

DR SYMONS: I am in sympathy with the remarks made, and I am wondering whether this substitution might be made.

Mr. Linton moved that the substitution be made.

MR. JONES: Does that only apply to State banks?

MR. NUTTLE: It should include the Federal banks also.

MR. JONES: My personal idea is that we had better leave it alone.

Mr. Linton's motion was seconded and adopted.

Mr. E. C. Speaks called for a recount, and Mr. Linton seconded. The vote was announced at 37 for to 31 against—substitute resolution, adopted.

DR. SYMONS: I do not like to see us divided so closely on a proposition. We might have a committee appointed to bring in a resolution that might be better suited to us all. I am strong for seeking some kind of relief in the interest rate, but I also recognize the directors of banks are presented with problems on the other side. I think those gentlemen are reading into the resolution more than it means. This resolution was only looking forward to the possibility of securing a reduction in the rates.

MR. COCKEY: It only takes one majority to elect. We have had a majority here. I do not think the resolution amounts to anything anyway, and I think we had better proceed.

"Trailer License Costs" was presented and seconded by Mr. Anderson and adopted.

"Farm Bureau Incorporation" was presented, seconded by Mr. Duvall.

MR. SMITH: Practically all of the Farm Bureaus in other States are incorporated, and my idea is that the Agricultural Corporation is incorporated. It will put our Farm Bureau in better legal shape. Our present legal set-up goes back some fifteen years, and we do not know how we stand in our real set-up.

MR. WISE: The Agricultural Society is incorporated, and we would like the Farm Bureau to be incorporated, so that they may work better together. We in the office have considered it very carefully and we hope that this body will pass the resolution.

Mr. S. H. Anderson, of Harford County, seconded the resolution and it was adopted.

"Memorial" was presented, and seconded by Mr. P. C. Turner, and adopted.

"Appreciation" was presented, seconded by Mr. Cockey and adopted.

MR. NUTTLE: We are asking the committee to insert the name of Senator Radcliffe in this resolution.

Mr. Speaks made the motion, Mr. Duvall seconded the motion and it was carried.

The State Poultry Council presented the following resolution:

....*Resolved:* The State Poultry Council expresses its deep appreciation to the Maryland Farm Bureau Federation for its splendid cooperation and support of the Poultry Council's program and the encouragement of the egg and chick show at this Annual Meeting.

HERBERT D. COPELAND, *President*,
Maryland State Poultry Council.

MR. NUTTLE: We want to offer our appreciation to the Poultry Council, and our delight at their having started the Poultry Show. It was a great pleasure to have them with us. We want them to feel that they are a vital part of our organization, and we want to assure them of our cooperation in all their efforts.

The motion was accepted with thanks.

The report of the Tax Committee was submitted by Mr. E. Thomas Massey, of Kent County, chairman.

MR. NUTTLE: This is a rather extensive report. It has a lot of information. If there is no objection we will just ask him to read the conclusions.

MR. SMITH: I know that it will take a lot of time to read this report. I move that the convention adopt this report from the Tax Committee.

Mr. Schillinger seconded the motion.

MR. NUTTLE: There is a whole lot to this report. and we can digest it later.

Mrs. Williams reported her resignation and the election of Mrs. Roy Weagley in her place as State Home and Community Chairman. Mrs. Williams was elected Vice-Chairman and Mrs. Spoerlein, Secretary.

DR. SYMONS: I think that this distinguished body of men should register our deep appreciation of the very wonderful services that Mrs. Williams has rendered to the Farm Bureau during this period. The motion was seconded and carried.

MR. NUTTLE: Mrs. Williams has been an outstanding member in Farm Bureau work in the State of Maryland. We certainly hate to lose her on our Board of Directors. She certainly can get up and speak her piece when the occasion arises. We will miss her clean-cut vision and her ability to express herself at our Board meetings.

MR. DAVIS: I would like to announce to this body that in appreciation of the services rendered by Mrs. Williams, we in Kent County recently elected Mrs. Williams Secretary and Treasurer of the Kent County Farm Bureau.

Mr. Wise here made some announcements.

MR. THIEROFF: This morning has been our first real Farm Bureau meeting, and I am sorry that we did not put in more than a half a day on it. Another year I think we should give the membership a chance to talk about their own problems rather than have a lot of high pressure salesmanship speakers come here to talk to us that really does not mean much to us. We really would rather have our own membership express their own views on what is going on to help us in our own problems at home.

MR. WISE: I am glad to hear that expression from Mr. Thieroff. I want to thank him for bringing that up. I am sure our committee will be very glad to so arrange next year.

MR. NUTTLE: We appreciate the suggestion from Mr. Thieroff. That is what we want, we want to work from the bottom up.

There being no further business the meeting was adjourned.

REPORT OF JOINT TAX COMMITTEE OF MARYLAND STATE GRANGE AND MARYLAND FARM BUREAU FEDERATION,

1935-1936

Introduction

Total property tax levies by the counties of Maryland decreased from approximately $15,000,000, in the 1931-32 levy year, to slightly over $10,000,000, in 1934-35. Much of the credit for bringing about this reduction in property taxes can be attributed to the activities of farm organizations. These reductions have been realized in two ways; one involving the reduction of local and State salaries and expenditures, and another in the utilization of State revenues for county road purposes.

It is quite apparent, however, that the trend in property tax levies has taken an upward turn. An analysis of the 1935-36 county levies shows that seventeen counties increased their tax rates, and subsequently the taxes levied against property, with the result that this year's levy is about $1,500,000 more than that for the previous year. This represents an increase, in one year, of fifteen per cent. in the farmers property tax bill. This increase was necessitated by old age pension requirements, restoration of salary reductions in late years, and county road debts previously provided for from the State gasoline tax fund.

Farm organizations should continue their activities and muster strength for the maintenance of a low property tax levy. There are many who feel that, despite the substantial reductions between 1931 and 1935 in property taxation, more drastic reductions will be necessary to bring about a proper adjustment of the tax burden among various potential tax-paying groups in society.

If the increases in cost of county government are inescapable, such increases should not rest upon the property tax to the point where it becomes an excessive burden to property owners. Some other form or forms of State revenues should be utilized for the purpose of permanently relieving the local tax load, and to spread the tax base.

It is not enough to simply deplore the existence of excessive taxation or to chide the increase in taxation for necessary purposes. Each unit or service of government is a definite package of goods or services and entails a definite cost. It is necessary to examine each of these packages carefully to determine their compensating value.

Tax Legislation at the 1935 Session of the Maryland Legislature

INHERITANCE TAX

The Maryland inheritance tax was amended so that a rate of one per cent. is now imposed upon shares of estates going to direct heirs, previously exempted, and the existing five per cent. tax upon estates going

to indirect or collateral heirs was increased to seven and one-half per cent. The effect of this change in the inheritance tax, in terms of increased revenue, will not be evident until a year following the change in the law, as most estates are not closed until about a year after inventories are filed.

GROSS RECEIPTS TAX

A one per cent. tax was imposed on all sales at retail made by vendors in the State, the liability of the tax being on the vendors. Parallel to the gross receipts tax, a tax of one per cent. was imposed upon the sale of motor vehicles registered in the State of Maryland.

GASOLINE TAX

An enactment of the 1933 Legislature, which distributed seventy per cent. of the one and one-half cent gas tax to counties for county road and road debt purposes, was reenacted in 1935. The expenditure of such funds is still left with the State Roads Commission. There was some endeavor to change the basis for apportioning the funds to the several counties, but such attempts failed.

INSTALLMENT PAYMENT OF TAXES

Counties are now permitted to accept installment payments of delinquent taxes; and installment payment of current tax levies was specifically authorized in the case of several counties.

TAX ON WINES

A tax of twenty cents per gallon of wine, with alcoholic content of not over fourteen per cent., replaced the previous tax of $1.10 per gallon.

RACE TRACK TAX

Although a bill passed the Legislature which reduced the $6,000 daily license fee on horse racing to $1,000 and increased the tax on sums wagered on races from one per cent. to two and one-half per cent., the bill was vetoed by the Governor.

State and County Problems With Reference to Relief and Old Age Pensions

In view of the evident intent of the Federal government to shift the responsibility of direct relief, in particular, to State and local governments, it is quite apparent that some plan must be evolved to take care of this shift. It is the opinion of this committee that the problem should be attacked from two angles; one with the purpose in mind of reducing the relief costs to real necessities, and the other having to do with the method of financing such real relief needs.

Total unemployment relief expenditures in Maryland for the year ended August 31, 1935 amounted to $16,647,625, of which $12,675,434, or seventy-six per cent., was expended in Baltimore City. Direct relief costs for the

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year totaled $12,011,473, of which $10,192,491, or eighty-five per cent., was in Baltimore City.

As of November 1, 1935, approximately 41,180 persons in the counties, and 72,598 in Baltimore City, were receiving relief. This involved 10,469 cases in the counties and 20,262 in Baltimore City. About forty-two per cent. of the relief cases in the counties contain no employable persons, the per cent. varying among the several counties from twelve in Montgomery County to eighty-one in Dorchester County. In Baltimore City twenty-two per cent. of the cases contained no employable persons.

Administrative costs amounted to $1,820,375, or eleven per cent. of the total relief expenditures. The cost of administration was about ten per cent. in Baltimore City and varied from nine per cent. to approximately twenty-six per cent. in the counties. It is the opinion of your committee that administrative costs should be decreased, unless such high costs are conducive to bringing about more far reaching results in putting people to work or in substantially reducing the relief roll to those in real need.

In terms of county tax rate equivalents necessary to provide for such total relief costs after deducting for old age pensions, counties would need to levy amounts varying from a tax rate of one-tenth of one cent in the case of Harford County to $1.54 in the case of Somerset County. For direct relief only, counties would need to levy tax rates varying from one-tenth of one cent to $1.27.

It is quite obvious that a transfer of the present relief load to the local property tax would constitute an unbearable burden on property owners in most counties of Maryland. This is as true, although to a lesser extent, in the case of direct relief as it is for total relief.

In the light of the present property tax levies, and the need for reduction of such levies, it is the opinion of this committee that relief costs should be financed in such a manner as will not increase materially the present property tax, but will, at the same time, give choice and power to the various counties with the express intent of keeping relief costs to an absolute minimum.

OLD-AGE PENSIONS

Old age pension levies by the several counties are shown in Table 5. Total outdoor pensions, which have been a function of county governments from the time of their existence, are separated from the old age pensions levies made in accordance with the Old Age Pension Act passed by the 1935 Legislature. Fourteen counties levied for old age pensions a sum total of $102,000. Other counties, whose last levies preceded the enactment of the Old Age Pension Law, are expected to provide for such in their ensuing levies.

It is estimated that 5,095 persons will be deserving of old age pensions

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in the counties and about 4,500 in Baltimore City. At a range of from $168 to $300 per person among the counties and Baltimore City, the total old age pension cost should be about $1,005,864 for the counties, and $1,350,000 for Baltimore City, or a total of $2,355,864. Assuming that the total cost of such a program will be borne by the State and local governments, and in consideration of the provisions of the present State law calling for one-third contribution on the part of the local governments, the counties will need to levy $335,188 and Baltimore City $450,000; making a total of $785,188 from local levies, and $1,570,676 required on the part of the State.

In terms of county tax rates, a levy against general property for old age pension requirements in the counties means an increase in the tax rate from less than one cent in Harford and Montgomery Counties to twenty-three cents in Somerset County.

Revenue Requirements

ECONOMY

This committee is of the opinion that more strict economy in governmental expenditures can be made without impairment of essential government. History has shown that the tendency for governmental expenditures is to increase. It is a difficult matter to hold down either the tax rates or the assessments. Each year some new demand or increase in the previous year's budget gives rise to an increase in the tax rate.

In some counties a part of the increase in tax rates may be due to a decrease in the assessable basis, largely on account of the decline in assessments on tangible personal property. This situation, as well as the lack of an adequate taxable basis by virtue of under-assessed property, can be at least partially corrected by reassessment where such is justified and economical.

This committee suggests that farm organizations in the several counties appoint a committee whose duty would be to affiliate with other county tax committees or governmental efficiency and economy committees, or to act alone, in studying the proposed levies and in recommending beneficial changes.

NORMAL REQUIREMENTS

It is obvious that certain normal requirements will add to the tax burden. These increased costs may be accounted for in several ways: To the restoration of salaries of county workers; to natural increases in governmental costs, particularly of schools, due to population increases affecting such functions; and to additional services afforded to public agencies, such as free transportation to schools for all pupils. Just how far counties might go in these respects and increase the tax burden should be a matter of appraisal on the part of citizens' groups, both in respect to their needs and their ability to pay for such needs.

ADDITIONAL REQUIREMENTS

It is apparent that, in accordance with the Old Age Pension Act passed by the 1935 Legislature, local and State governments must provide additional revenue for old age pensions. In addition, many relief cases containing unemployables represent an obligation on the part of State and local governments.

It is the opinion of this committee that expenditures by the State and local governments for relief should be confined as nearly as possible to deserving old age pension cases and to unemployables together with their dependents. Any expenditures beyond these two necessities, namely old age pensions and unemployables, that tend to approach the staggering sums spent for relief in the past should be carefully studied before attempting to levy taxes for such addition burdens. Every possible means should be used to reduce these requirements to a minimum. In any event, the necessity of tax revenue for such purposes should not materially increase the local property tax. This does not necessarily mean that local counties should not levy against property for relief purposes. It simply means that the ultimate effect of the total tax program in taking care of all governmental functions, including relief and old age pensions, should not increase the property tax.

Any urgent emergency, and absolute needs for relief and old age pensions may be provided for out of a "Relief Equalization Fund" derived from specific State tax revenues. By properly distributing such "Relief Equalization Fund," and by exercising the strictest economy in relief expenditures, it should not be necessary for the counties to levy any considerable tax against general property for relief and old age pensions.

Potential Revenue Sources for Additional Requirements

This committee is of the opinion that a State income tax on individuals should be the first new source of revenue utilized by the State for additional funds to care for relief and old age pensions. Graduated net income taxes on personal incomes are in effect in twenty-eight States[1]; in addition, five States tax certain kinds of incomes, mostly from intangibles.

Table 7 shows the lowest and highest tax rate applied to net incomes of individuals in those States levying income taxes. In most of the States the rate of tax ranges from one to six per cent. In two States the tax rate on large incomes goes as high as fifteen per cent. Only three States levy a rate of less than four per cent. on high income brackets.

Table 8 gives the personal exemptions allowed in the various States and the Federal government, as well as the revenue receipts from personal income taxes for the year ending in 1935. Exemptions for a single person

[1]In Pennsylvania the income tax was recently declared unconstitutional.

range from $600 to $1500; for married persons, from $1200 to $3000; and for each dependent, from $200 to $400.

In estimating returns from income taxation, the amount and form of exemption must be carefully regarded. The average individual income is comparatively low. Consequently, small adjustments in exemptions affect a large number of incomes and a large percentage of the incomes of the people. Therefore, lowering the exemptions to the minimum, such as is practiced in England, makes all self-supporting persons and families contribute to the government. Lowering the exemptions does not necessarily increase the relative cost of administration, since the first taxable bracket with small tax liability constitutes a large percentage of the total returns regardless of the amount of exemption.

The Federal tax on incomes of individuals making their returns in Maryland has ranged between approximately $9,100,000 and $11,800,000 during the last four years. Taxes on net incomes of corporations have been similar in amounts. Estimated revenue that might be obtained from a net income tax on individuals in Maryland is given in Table 10. Computations were made at varying rates and exemptions in order to show the probable range in revenue. The estimates of revenue from computations made range from about $865,000 to $3,600,000.

SALES TAXES

While sales taxes in general are not favored as a means of producing governmental revenue, there may be situations where governments need to resort to such measures. Twenty-three States are utilizing the retail sales tax. In some States the retail sales tax is used in combination with other forms of turnover taxes closely akin to gross income taxation. Table 11 shows the rate of tax applied to retail sales in various States and the revenue accruing from such taxes for the year ending in 1935. Four States tax retail sales at a one per cent. rate; thirteen States, at two per cent.; and six States, at three per cent.

In estimating the probable sales tax revenue in Maryland, it is recognized that the revenue would be considerably varied by the exemptions, the definition and interpretations of retail sales, and the method of administering and collecting the tax. From the experience of revenues produced under the one per cent. gross receipts tax in Maryland and the revenues obtained in other States, it seems likely that the State of Maryland might obtain the following amounts of revenue from various tax rates on retail sales:

Tax Rate	Estimated Revenue
1%	$3,750,000 to $5,000,000
2%	7,000,000 to 9,500,000
3%	10,000,000 to 13,000,000

The first six months collections from the gross receipts tax in Maryland

amounted to approximately $2,082,000. In addition, the automobile title tax produced $238,000, making a total of approximately $2,320,000. About sixty-one per cent. of the gross receipts tax was collected in Baltimore City. Table 12 shows the collections in the counties and Baltimore City for the first six months from the gross receipts tax.

SPECIAL TAXES

During the last General Assembly certain commodities and services, as well as a tax on utilities and amusements, were considered for taxation by the State. While some of these proposed taxes would produce rather nominal amounts of revenue, the taxation of those except public utilities might be warranted on the basis of their comparative usefulness in society.

Maryland is the only State where beer is legalized but not taxed, except through licenses issued for the sale of beer. Forty-three States tax beer on an excise basis at rates varying from two cents to fifteen cents per gallon. The State of Maryland does not tax the manufacturing of distilled liquor. This represents an untapped potential source of revenue utilized by States other than Maryland.

The estimated revenues from taxes on various commodities and services in Maryland are as follows:

Commodity or Service	Rate of Tax	Estimated Revenue
Public Utilities— Electric Light and Power Companies, Gas Companies, and Telephone Companies	2% of gross receipts	$600,000
Cosmetics and Toilet Articles	10% of retail price	350,000
Patent Medicines and Drugs	10% of retail	600,000
Whiskey	5c per gal. manufactured	500,000
Beer	3c per gal. consumed	600,000
Amusements	5% of gross incomes	371,000

Roads

There has been much agitation and many proposals for the diversion of gasoline tax revenues, either directly or indirectly, for purposes other than roads. We consider this to be a bad fiscal policy and urge that the gasoline tax revenue be continued for road purposes only. Furthermore, expenditures on county roads should be kept within allotments to the counties and counties should not be permitted to overdraw their accounts unless emergency situations arise. Repair and maintenance one year, followed by abandonment the next year, is not conducive to a constructive road program.

In order to make available necessary road facilities to the greatest number of farmers of this State, it is the consensus of opinion of this committee that the future road improvement program in rural communi-

ties should be confined largely to low-cost farm-to-market roads. Improving the conditions of the earth road, such as widening, ditching and proper draining, will not only serve as an immediate benefit, but it will also lay the proper foundation for future improvement of the road toward higher type surfaces. It is a recognized fact that traffic conditions do not always justify large capital outlays for State lateral roads in rural territories. This experience should be sufficient justification for adopting a policy of road improvement whereby the total outlay and maintenance cost will be more in proportion to the traffic needs.

Conclusion and Recommendations for Additional Revenue

This committee is of the opinion that present relief and anticipated old age pension expenditures should be carefully watched with the object of decreasing the same to urgent and absolute needs.

It is obvious that general property cannot bear all the tax necessary to provide for both old age pension and relief requirements. We are of the opinion that ultimately public relief expenditures should be borne jointly by State and local governments. We feel that a healthier situation will be created in respect to such functions as relief and old age pensions if local governments are responsible for a considerable part of the expenses of such functions.

The following recommendations are offered in respect to new sources for State revenue:

1. That a State income tax be levied against individuals to provide for the State's share of the cost of old age pensions. Any revenue from this source over and above old age pension costs to the State are to be added to the "Relief Equalization Fund" hereinafter provided for. In order to provide adequate revenue from this source, the following suggestions are made regarding the major provisions that should be contained in such income tax bill:

   a. Tax rate to be two per cent. on all net incomes.

   b. Personal exemptions the same as those for Federal income tax purposes.

   c. Dividends from corporations to be included.

   d. The following exemptions would be allowed on gross incomes:
      (1) Life insurance benefits.
      (2) Interest on bonds of the State of Maryland and the United States Government.
      (3) Salaries and wages of United States employees.

   e. The following deductions would be allowed:
      (1) Taxes paid to the United States Government and taxes paid to State or local governments in Maryland, excepting State income taxes.
      (2) Interest on indebtedness.

f. Residents to be taxed on the basis of their entire net incomes.

g. Non-residents to be taxed on the basis of net income derived from property owned within the State, and from income from trades, professions and occupations carried on in the State.

II. That on account of emergency situations, and in view of the fact that revenue from a net income tax law would not be forthcoming immediately after enactment, a tax of two per cent. on gross receipts of public utilities (electric light and power companies, gas companies and telephone companies) be levied for one year only for the State's share of old age pension costs.

III. That a "Relief Equalization Fund" be set up for the purpose of providing for emergency relief situations, including old age pensions. That seventy-five per cent. of such emergency "Relief Equalization Fund" go to Baltimore City, and the remaining twenty-five per cent. to the counties, to be distributed on the basis of per cent. of relief cases containing unemployables; provided, however, that counties be required to levy against property, toward an amount equal to their respective shares in the "Relief Equalization Fund," but not exceeding ten cents in the county tax rate.

The following revenue sources are recommended for the "Relief Equalization Fund":

a. Surplus from State income tax over and above the States share of old age pension costs.

b. A tax of ten per cent. on admission to amusements, and on toilet articles, cosmetics, drugs and patent medicines.

c. A tax of five cents per gallon of distilled liquors manufactured in the State.

d. A tax of three cents per gallon of beer consumed in the State.

IV. That, if any sales tax is necessary to provide for relief needs, we recommend that the revenue from such tax be distributed as follows:

a. One-half to be divided, sixty per cent. to Baltimore City and forty per cent. to counties, for the reduction of the property tax levies for school purposes. In no event should this reduction in county tax rates be so great as to lower the minimum school tax rate to less than thirty cents. Distributing sales tax revenue in this manner and for this purpose would provide tax reduction for counties and Baltimore City, thus permitting them to levy for relief and old age pensions without increasing the property tax burden. This procedure, whereby the local governments would be responsible for a part of both relief and school costs, is considered to be desirable and especially conducive to a more healthy condition in reference to relief.

b. One-half to be allocated back to the counties and Baltimore City on the basis of collections from those units for unemployment relief and old age pensions, or for other governmental functions.

The following are offered as major provisions to be included in any retail sales tax bill:

a. That the term "retail sale" or "sale at retail" *exclude* all sales in which the purpose of the consumer is to incorporate the thing transferred as a material or part of, or in which the thing transferred is consumed, used or indispensable in, the manufacturing, processing, assembling or refining of personal property for final consumption; and that farming shall be considered as manufacturing or processing in the interpretation of the act.

b. That no exemptions be permitted.

c. That the mechanism or method used in collecting the tax be such as to prevent an excessive tax rate on small-price articles.

Appendix

The following twelve tables present statistical data which were used as a background for discussion in this report and which were taken into consideration in the preceding recommendations.

Table 1. Total Levies and Tax Rates for County Purposes, Maryland, 1931-32, 1934-35 and 1935-36

County	Levies			County Rates		
	1931-32	1934-35	1935-36	1931-32	1934-35	1935-36
Allegany	$1,381,699	$985,500	$1,264,030	1.57	1.25	1.42
Anne Arundel*	1,274,426	850,306	925,113	2.43	1.81	1.89
Baltimore*	3,166,694	2,339,310	2,317,400	1.65	1.18	1.26
Calvert	132,102	63,719	80,493	2.34	1.10	1.35
Caroline	305,442	152,530	199,028	1.50	.98	1.08
Carroll	687,358	392,967	444,195	1.65	1.00	1.10
Cecil	557,073	310,676	323,448	1.30	.80	.78
Charles	133,181	89,028	111,951	1.35	.90	1.15
Dorchester	454,276	218,198	252,341	1.80	1.00	1.00
Frederick*	952,796	627,575	773,744	1.30	.90	.95
Garrett	377,688	179,471	179,711	1.77	1.00	1.00
Harford*	621,276	482,241	473,295	1.45	.95	.95
Howard	335,360	202,822	240,572	1.63	.95	1.00
Kent	300,869	140,382	242,347	1.67	.84	1.21
Montgomery	1,299,067	874,418	1,368,533	1.30	.90	1.50
Prince George's	914,929	617,855	645,670	1.52	.99	1.00
Queen Anne's	270,641	125,640	166,539	1.50	.78	1.00
St. Mary's	132,911	79,939	86,102	1.55	.92	1.00
Somerset	299,658	124,116	146,348	1.75	1.00	1.20
Talbot	311,877	178,164	186,736	1.46	.85	.85
Washington	1,021,803	652,948	720,815	1.30	.88	.97
Wicomico	490,082	282,272	330,975	1.70	.88	1.06
Worcester	324,003	193,575	191,973	1.45	.95	.95
Total	$15,675,211	$10,163,649	$11,671,359			

*Counties now using calendar year as levy year.
Source of data: County levy statements.

Table 2. Relief Expenditures in Maryland for the Year Ending August 31, 1935

County	Unemployment Relief Expenditures for Year Ending August 31, 1935			Administrative Expense as Per Cent. of Total Relief Cost
	Total	Direct Relief	Administration	
Allegany	$528,843	$189,418	$58,670	11.1
Anne Arundel	196,262	95,631	28,196	14.4
Baltimore	336,749	185,479	59,204	17.6
Calvert	46,216	15,510	11,375	24.6
Caroline	38,393	24,781	9,894	25.8
Carroll	1,299	739	560	.....*
Cecil	69,817	31,157	14,839	21.3
Charles	43,217	23,675	10,543	24.4
Dorchester	79,532	51,109	20,511	25.8
Frederick	537,832	231,692	62,988	11.7
Garrett	275,019	106,409	65,048	23.7
Harford	.....	.....	.....	.....
Howard	53,703	15,250	7,741	14.4
Kent	43,132	21,426	10,240	23.7
Montgomery	229,497	69,231	39,589	17.3
Prince George's	187,975	55,444	39,798	21.2
Queen Anne's	47,823	30,422	9,712	20.3
St. Mary's	55,598	34,154	13,672	24.6
Somerset	222,471	170,990	32,305	22.1
Talbot	36,479	18,684	9,020	24.7
Washington	564,927	284,034	51,219	9.1
Wicomico	240,458	121,538	39,094	16.3
Worcester	136,949	41,209	24,500	17.9
Totals of Counties...	3,972,191	1,818,982	618,709	15.6
Baltimore City	12,675,434	10,192,491	1,201,666	9.5
State Totals	$16,647,625	$12,011,473	$1,820,375	10.9

*Not calculated, as relief organization was set up in last month of the year in question.

Source of data: Monthly bulletins on relief statistics, published by the Maryland Emergency Relief Administration.

Table 3. Total Relief Cases and Cases Containing No Employable Persons, Maryland, November 1, 1935

County	Total Cases Receiving Relief	Total Cases Containing No Employable Persons	
		Number	Per Cent.
Allegany	1,550	416	26.8
Anne Arundel	456	203	44.5
Baltimore	490	207	42.2
Calvert	147	88	59.9
Caroline	200	96	48.0
Carroll	135	43	31.9
Cecil	199	91	45.7
Charles	201	120	60.0
Dorchester	354	285	80.5
Frederick	1,276	373	29.2
Garrett	715	180	25.2
Harford	29	16	55.2
Howard	64	20	31.3
Kent	119	93	78.2
Montgomery	245	30	12.2
Prince George's	254	50	20.0
Queen Anne's	155	104	67.1
St. Mary's	204	127	62.3
Somerset	821	532	64.8
Talbot	83	64	77.2
Washington	1,641	527	32.1
Wicomico	796	458	57.5
Worcester	335	241	71.9
Total Counties	10,469	4,364	41.7
Baltimore City	20,262	4,546	22.4

Source of data: Maryland Emergency Relief Administration.

Table 4. County Tax Rate Equivalents Necessary If Relief Costs Were Levied for Locally Against General Property*

County	Total Relief (Cents)	Direct Relief (Cents)
Allegany	64.0	24.2
Anne Arundel	36.7	19.4
Baltimore	18.1	11.1
Calvert	74.8	32.1
Caroline	37.8	17.8
Carroll	.3	.3
Cecil	17.7	9.3
Charles	40.5	26.1
Dorchester	34.6	26.5
Frederick	79.5	36.9
Garrett	144.7	71.6
Harford	.1	.1
Howard	27.6	8.5
Kent	18.4	9.0
Montgomery	25.0	9.2
Prince George's	27.9	10.4
Queen Anne's	25.7	18.3
St. Mary's	55.2	39.1
Somerset	153.6	126.9
Talbot	11.4	5.3
Washington	81.0	43.1
Wicomico	72.2	38.2
Worcester	52.2	12.6
Baltimore City	108.6	95.4

*Based on relief costs for year ended August 31, 1935, and with deduction made for transfers to old-age pensions.

Table 5. Old Age Pension Levies by Counties, Maryland, 1935-36

County	Outdoor Pensions	Old Age Pension Under New Act	Total
Allegany	$8,700*	$30,000	$38,700
Anne Arundel	6,800*	.....	6,800
Baltimore	17,000†	.....	17,000
Calvert	2,279	.....	2,279
Caroline	500	4,000	4,500
Carroll	4,000	.....	4,000
Cecil	.....	10,000	10,000
Charles	1,000	2,000	3,000
Dorchester	4,500	.....	4,500
Frederick	2,000	.....	2,000
Garrett	10,000	.....	10,000
Harford	4,500	.....	4,500
Howard	1,000	3,000	4,000
Kent	500	3,000	3,500
Montgomery	24,500	.....	24,500
Prince George's	4,899	.....	4,899
Queen Anne's	.....	10,000	10,000
St. Mary's	785	3,333	4,118
Somerset	800	4,000	4,800
Talbot	500	5,000	5,500
Washington	10,000	12,293	22,293
Wicomico	10,000	10,000	20,000
Worcester	5,000	5,000	10,000
Total	$119,263	$101,626	$220,889

*Includes mothers' and widows' pensions.
†Includes charities.
Source of data: County levy statements.

Table 6. Estimated Old Age Pension Requirements for Maryland

County	Number Deserving Pensions	Revenue Requirements*		County Tax Rate Necessary for Old Age Pensions
		Total	County	
Allegany	447	$96,552	$32,183	4.18
Anne Arundel	255	55,080	18,360	3.75
Baltimore	251	60,240	20,080	1.18
Calvert	51	8,568	2,856	4.94
Caroline	128	21,504	7,168	5.10
Carroll	91	17,472	5,824	1.71
Cecil	134	25,728	8,576	2.35
Charles	89	14,952	4,984	5.15
Dorchester	371	71,232	23,744	10.74
Frederick	516	111,456	37,152	5.83
Garrett	254	48,768	16,156	9.15
Harford	54	10,368	3,456	.82
Howard	60	12,960	4,320	2.45
Kent	125	21,000	7,000	4.34
Montgomery	67	16,080	5,360	.61
Prince George's	130	28,080	9,360	1.46
Queen Anne's	97	16,296	5,432	3.38
St. Mary's	163	27,384	9,128	11.33
Somerset	467	78,456	26,152	22.70
Talbot	120	23,040	7,680	3.84
Washington	478	103,248	34,416	5.18
Wicomico	496	95,232	31,744	11.32
Worcester	251	42,168	14,056	7.13
Total of Counties	5,095	$1,005,864	$335,188	.....
Baltimore City	4,500	1,350,000	450,000	4.3
State Total	9,596	$2,355,864	$785,188	.....

*Two-thirds to be furnished by the State and one-third by the counties and Baltimore City. No allowance is made for possible contribution by the Federal Government.

Table 7. State Graduated Net Income Taxes on Personal Net Income October 1, 1935[1]

State	Lowest Rate Applied and Net Income Amount Affected:		Highest Rate Applied and Net Income Amount Affected:	
	Rate Per Cent.	Amount of Income	Rate Per Cent.	Amount of Income
Alabama	1	First $1,000	5	$8,000 plus
Arizona	1	" 2,000	4½	9,000 "
Arkansas	1	" 3,000	5	25,000 "
California	1	" 5,000	15	250,000 "
Delaware	1	" 3,000	3	10,000 "
Georgia	1	" 5,000	5	20,000 "
Idaho	1½	" 1,000	8	5,000 "
Iowa	1	" 1,000	5	5,000 "
Kansas	1	" 2,000	4	7,000 "
Louisiana	2	" 10,000	6	50,000 "
Minnesota	1	" 1,000	5	10,000 "
Mississippi	2½	" 2,000	6	15,000 "
Missouri	1	" 1,000	4	9,000 "
Montana	1	" 2,000	4	6,000 "
New Mexico	1	" 10,000	4	100,000 "
New York[2]	3	" 1,000	8	9,000 "
North Carolina	3	" 2,000	6	6,000 "
North Dakota	1	" 1,000	15	15,000 "
Oklahoma	1	" 1,000	9	8,000 "
Oregon[3]	2	" 1,000	7	5,000 "
Pennsylvania[4]	2	" 5,000	8	100,000 "
South Carolina	2	" 2,000	5	6,000 "
South Dakota	1	" 1,000	8	318,000 "
Utah	1	" 1,000	5	4,000 "
Virginia	1½	" 3,000	3	5,000 "
Washington[5]	3	" 1,000	4	4,000 "
West Virginia	1	" 1,000	3	6,000 "
Wisconsin	1	" 1,000	7	12,000 "

[1]The following States tax incomes from certain intangible sources: Massachusetts, 1-6 per cent: Ohio, 5 per cent: Tennessee, 5 per cent: Vermont, 2 and 4 per cent; New Hampshire, same rate as for other property.

[2]Includes a 1 per cent emergency tax on all incomes.

[3]Intangible yield taxed at 8 per cent.

[4]Recently declared unconstitutional by Supreme Court of Pennsylvania.

[5]Surtax of 4 per cent on incomes of $4,000 and over.

Source of data: The Interstate Commission on Conflicting Taxation report on "Conflicting Taxation," 1935.

Table 8. Personal Exemptions of and Revenue Receipts From State Graduated Personal Net Income Taxes, 1935

State	Personal Exemptions			Revenue Receipts, 1935
	Single Person	Married Persons	Each Dependent	
Alabama	$1,500	$3,000	$300	$250,000
Arizona	$10 Tax	$20 Tax	$4 Tax	325,101[1]
Arkansas	1,500	2,500	400	147,045
California	1,000	2,500	400	New Law
Delaware	1,000	2,000	200	774,629
Georgia	1,500	3,500	400	1,766,000[1]
Idaho	700	1,500	200	115,061
Iowa	$6 Tax	$12 Tax	$2 Tax	2,700,000[2]
Kansas	750	1,500	200	900,385
Louisiana	1,000	2,500	400	767,437
Minnesota	1,200	2,000	250	3,500,000[3]
Mississippi	750	1,500	200	701,221[1]
Missouri	1,000	2,000	200	2,143,531
Montana	1,000	2,000	300	285,708
New Mexico	1,500	2,500	200	49,362[4]
New York	1,000	2,500	400	58,659,782
North Carolina	1,000	2,000	200	1,213,290
North Dakota	$5 Tax	$15 Tax	$2 Tax	No Data
Oklahoma	850	1,700	300	1,100,000[5]
Oregon	800	1,500	300	1,581,322
Pennsylvania[6]	1,000	1,500	400	New Law
South Carolina	1,000	1,800	200	618,793
South Dakota	$6 Tax	$12 Tax	$2 Tax	New Law
Utah	600	1,200	300	212,005
Virginia	1,000	2,000	200	762,937
Washington	1,000	2,500	400	No Data
West Virginia	600	1,300	200	New Law
Wisconsin	$8 Tax	$17.50 Tax	$4 Tax	2,961,389
Federal Government	1,000	2,500	4,000	527,112,506

[1]Includes corporation income tax—no separation possible.

[2]Estimate by Iowa official—$2,100,000 being collected the first six months.

[3]Estimate by Minnesota official, based on partial return.

[4]Six months.

[5]Approximate.

[6]Recently declared unconstitutional by Supreme Court of Pennsylvania.

Source of data: The Interstate Commission on Conflicting Taxation report on "Conflicting Taxation," 1935.

Table 9. Federal Income Tax Collections in Maryland, Years Ending January 30, 1932 to 1935

Year Ending June 30	Tax on Individuals	Tax on Corporations	Total Tax
1932	$10,025,373	$11,796,430	$21,822,803
1933	9,148,879	9,800,581	18,949,460
1934	9,859,279	9,294,744	19,154,023
1935	11,816,154	10,239,210	22,055,364

Source of data: Annual Report of the U. S. Bureau of Internal Revenue.

Table 10. Estimated Revenue From a State Net Income Tax on Individuals in Maryland

	With Dividends Included*		With Dividends Excluded†	
Item	Personal Exemptions Same as for Federal Income Tax Purposes	Personal Exemptions Half of Those for Federal Income Tax Purposes	Personal Exemptions Same as for Federal Income Tax Purposes	Personal Exemptions Half of Those for Federal Income Tax Purposes
Tax Rate:				
2% All incomes	$2,051,604	$3,499,628	$1,402,566	$2,692,099
1% First $1,000 2% Second $1,000 .. 3% All over $2000	2,037,592	3,619,813	1,301,550	2,500,730
1% First $1,000 2% Next $7,000 ..... 3% on $10,000 plus	1,723,543	2,614,040	864,878	1,703,438

*Total Federal tax deducted.

†Normal Federal tax deducted.

Source of data: Based on Statistics of Income for 1932, U. S. Bureau of Internal Revenue. The data are for returns of incomes for Federal income tax purposes, and concern incomes made in 1932 and reported in 1933.

Table 11. Retail Sales Tax Rates and Revenue Receipts, by State, 1935

State	Rate of Tax On Retail Sales (Per Cent.)	Revenue Receipts, 1935		Average Tax per Family
		Length of Record	Amount for One Year[1]	
Arizona	2	One Year	$1,794,818	16.93
Arkansas	2	No Data—New Tax		.....
California	3	One Year	60,545,117[2]	37.60
Colorado	2	Six Months	5,535,753	20.71
Idaho	2	No Data		
Illinois	3	One Year[3]	39,033,801	20.23
Indiana	1	One Year	6,802,860	7.71
Iowa	2	One Year	11,337,171	18.15
Kentucky	3	One Year	10,007,984	16.42
Maryland	1	Six Months	4,658,897	12.10
Michigan	3	One Year	38,789,000	32.86
Mississippi	2	One Year	4,020,321	8.52
Missouri	1	10½ Months	4,373,520[4]	4.66
New Mexico	2	One Year	1,879,535	19.07
North Carolina	3	One Year	7,657,498	11.89
North Dakota	2	No Data		
Ohio	3	Eight Months	47,038,212	27.70
Oklahoma	1	One Year	4,687,147	8.31
South Dakota	2	No Data—New Tax		.....
Utah	2	One Year	2,496,097	21.53
Washington	2	One Year	5,466,147[4]	12.90
West Virginia	2	Eleven Months	6,802,944	17.94
Wyoming	2	Three Months	1,272,852	22.38

[1]Converted to one year basis if only partial year's return was available.
[2]From the 2½ per cent. tax which expired July 1, 1935.
[3]Calendar year 1935.
[4]From the ½ per cent. tax expired.
Source of data: Correspondence with State officials.

Table 12. Gross Receipts Tax Revenue, for First Six Months Ending October 31, 1935, by Counties, Maryland

County	Tax Collected	
	Amount	Per Cent. of Total
Allegany	$100,476.28	4.83
Anne Arundel	54,023.15	2.59
Baltimore	92,999.81	4.46
Calvert	7,993.54	.38
Caroline	14,747.35	.72
Carroll	39,072.95	1.89
Cecil	23,333.80	1.12
Charles	10,488.56	.50
Dorchester	23,923.78	1.15
Frederick	59,778.59	2.87
Garrett	13,204.54	.63
Harford	29,317.14	1.41
Howard	14,297.09	.69
Kent	15,836.94	.76
Montgomery	64,276.29	3.09
Prince George's	54,821.09	2.63
Queen Anne's	12,052.01	.58
St. Mary's	8,376.95	.40
Somerset	12,668.65	.61
Talbot	19,137.14	.92
Washington	78,146.25	3.75
Wicomico	38,785.72	1.87
Worcester	26,382.25	1.26
Baltimore City	1,261,744.59	60.59
Out of State	6,235.38	.30
Total	$2,082,119.84	100.00

Source of data: Maryland Comptroller's Office.

This report is respectfully submitted by the Joint Committee of the Maryland State Grange and the Maryland Farm Bureau Federation:

D. C. HARRY, *Chairman*,

C. E. WISE, JR., *Secretary*,
E. T. MASSEY,
H. H. NUTTLE,
C. T. COCKEY, JR.,
T. B. SYMONS,
R. C. F. WEAGLEY,
T. S. ANDERSON,
T. ROY BROOKES,
W. P. WALKER,
S. H. DEVAULT,
A. B. ENSOR,
HOMER REMSBERG.

RESOLUTIONS OF MARYLAND FARM BUREAU FEDERATION, 1936

We pledge anew our confidence in President O'Neal and other officers of the American Farm Bureau Federation. We commend their efforts to correlate all organized farmers into a national program for agriculture. We are pleased with the achievements of our national Farm Bureau during the past year and pledge our support to that organization in the re-formation and adoption of a substitute for the A.A.A. program.

Farm Credit

We wish to pay tribute to the value of the Federal financing and re-financing of the farmer. Many foreclosures and bankruptcies have been headed off; many families have been kept together on the farm and given a chance to work out their economic salvation. We recommend that every possible means be employed to lower the general averages of interest rates charged farmers. We believe that the cost of distributing credit can be lowered—thereby reducing the spread between wholesale rates now available and the total cost to those securing the loans.

We favor the amendment of Farm Credit laws so that a majority of the directors of Farm Credit institutions, owned by farmer-borrowers, may be elected by such borrowers.

We urge more equitable loan values on livestock in several farm credit administration districts.

We urge the adoption of a system in production credit associations which will permit a borrower to establish his credit rating at the time of the first loan, which rating subsequently may be used as a basis for establishing the amount of the loan instead of adding costs and charges every year in addition to the original interest rate.

We urge longer terms of payment of production credit loans.

We favor the strengthening of the Production Credit Associations and National Farm Loan Associations as farmer-owned and farmer-controlled credit cooperatives and urge all farmers to attend business meetings and otherwise to help build these local organizations.

Public Safety

The annual toll of death through automobile accident has become a menace worse, in number of fatalities, than war. The economic loss from automobile accidents adds an estimated one cent a mile to the costs of operating an automobile. Therefore, we urge the Maryland Farm Bureau Federation to do all in its power to bring to the attention of all people the terrible toll of automobile accidents. We pledge our cooperation to all agencies working toward the prevention of automobile accidents. We urge the strict enforcement of laws and traffic regulations having a bear-

ing on our accident record, and the elimination of road hazards wherever possible.

Taxation—Tax Committee Report

We highly commend the members of the Joint Committee of the Grange and the Farm Bureau for the work done on their comprehensive report of the tax situation and their sound recommendations for tax legislation. We hereby endorse the report carrying with it the recommendations for a State Income Tax, an emergency gross receipts tax on public utilities and the establishment of a Relief Equalization Fund.

Legislative Economy Committees

We urge the Farm Bureaus of the several counties to appoint committees in each county whose duty would be to study all proposed tax levies and county governmental functions and recommend beneficial changes when necessary.

Land Use

The Maryland Farm Bureau is sympathetic to the development of an intelligent and systematic land use policy. We recognize that there are several sections in the State which contain sub-marginal land that could be better devoted to reforestation and conservation than to any phase of agricultural production. Our organization wishes to cooperate with the State and Federal Governments in their present and future plans for proper land use.

Truck Marketing

We ask that a special committee be appointed by the State Farm Bureau to make a study of the truck growing and truck marketing situation in Maryland including the relationship of other States thereto.

Can Price Investigation

Our canning crops contribute much to the welfare of the farmer. We believe the prices of cans, set by what is practically a monopoly, are too high and hereby direct our Secretary to transmit our protest against such prices to the proper authorities in Washington and request a thorough investigation of can prices and profits.

Extension Appropriations

We urge the return of the excessive cuts made by the Legislatures of 1933 and 1935 to our State University, the University of Maryland,—more and more, our people are needing the assistance of this institution through its research, instruction, and extension work. This need is greater today than ever before. We particularly urge the return of funds previously appopriated for the promotion of our several agricultural industries, so that our extension and other forces of the institution may be enabled to serve our industry more adequately.

Japanese Beetle

We urge the appropriation of $25,000 the original sum allotted to our fight on the control and spread of the Japanese beetle in this State... We are satisfied that great sums of money have been saved to the people in the vigorous manner in which we have held back the spread of this pest in the State, and we urge the fight be continued.

Weed Control

We recommend that the Board of Directors appoint a committee to call upon the State Roads Commission in regards to the matter of weed control along State highways.

Gas Tax Diversion

We protest the diversion of any revenue obtained from gasoline taxes for any purpose other than highway building, maintenance and debt service, from the two cent gas tax allotment, and half cent allotment for elimination of grade crossings.

We recommend the continuance of the allocation of the one and a half cent gas tax to the counties of the State for the construction and maintenance of lateral roads and debt service as at present provided by law.

Rural Electrification

Certain sections of the State do not possess the advantages of electrification. Maryland utilities serving rural areas of the State have in conjunction with the R. E. A., made certain plans to make such electrification possible. This rural electrification program is hereby endorsed and the utility companies are further requested to carry out plans as speedily as possible. We offer our cooperation to the utilities on plans which will provide proper coverage at reasonable rates, but will proceed with our own co-operatives in localities where this is not done. We further urge county Farm Bureaus to disseminate information regarding the rural electrification program as widely as possible.

Farm to Market Roads

We register our disappointment in the progress made in building Farm to Market Roads in this State as authorized by the Federal Works Progress Administration. We recognize the difficulties that have been apparent in getting this important work under way in this State. We recognize that the building of Farm to Market Roads is not dependent entirely upon availability of relief labor in any particular locality, but that local labor other than farm relief rolls can be utilized in this work.

We, therefore, earnestly urge our State Works Progress Administration to vigorously push this project with the elimination as far as possible

of so-called red tape and recognize the County Commissioners of each County as the local authority under which this work should be approved and prosecuted in conjunction with State and Federal authorities.

We are anxious that public opinion in this State be awakened to the importance and practicability of eliminating some of our bad country roads through this instrumentality.

Relief

Farmers of the State have been greatly concerned in the relief situation in Maryland.

We recommend that the administration of relief be returned to local authorities and that Federal, State and local funds be used for this purpose so that only the absolute necessities in relief be provided.

We feel that partial payment of local taxes for relief will be the greatest safeguard against unwise and unnecessary expenditure of funds for this purpose.

Grades and Standards

We urge the passage of a general law by the Legislature giving the State Board of Agriculture proper authority to issue rules and regulations providing grades and standards of various agricultural commodities to aid in improving the quality of products offered for sale. We feel that voluntary action of this character will greatly aid in sustaining the market for some of our important vegetable, fruit, and farm products.

Tobacco Products Tax

The imposition of a tobacco tax would be an additional burden on our tobacco growing counties and we wish to go on record as being opposed to any additional tax on tobacco.

Farm Bureau Program

We recmmend the adoption of the principles and plans for a program of work as enunciated in the President's Annual Address and the Secretary's Annual Report;

We heartily endorse these plans and program, and urge that they be distributed to our County Farm Bureaus for their guidance and suggestion.

Liquor Control

A serious condition has arisen since repeal of the 18th Amendment relating to the sale of intoxicating beverages on the Sabbath Day and until 6 A. M. Monday. This situation is objected to by citizens and in many instances by dispensers as well and has a direct bearing on highway safety. We therefore wish to go on record as opposed to the sale of intoxicants on the Sabbath Day in any manner whatsoever.

Truck Fruit Sales

We recommend that the Maryland Farm Bureau co-operate with the Roadside Market Association in approaching our State authorities in relation to the practice of certain individuals selling fruits and vegetables by trucks in competition with our retailers and farmers.

National Agricultural Policy

We recognize the serious situation that has developed as the result of the decision of the Supreme Court in rendering the Agricultural Adjustment Act as unconstitutional. We appreciate the action of the administration in inviting our National farm leaders in conference to develop a plan for substitute legislation.

We hereby declare our support of the plan that our national farm organization advocates.

We recognize the conflicting and difficult problems that naturally arise in devising a program that will continue to aid in providing parity for agriculture.

We stand fundamentally for co-operative action in developing a long time program in conservation of our soil resources and a crop adjustment precedure that will enable our farmers to secure a reasonable return for labor and capital invested.

Processing Taxes

We urge our banking authorities to consider the advisability of reducing processors can conclusively prove that said taxes were not passed on to consumers or taken off of the products of producers, and

We request the Members of Congress to support this attitude in any legislation that may be proposed to Congress.

Interest Rates

We are our banking authorities to consider the advisability of reducing the rate of interest on short time loans and that a committee be appointed to confer with Federal and State Banking authorities relative to this important problem.

Trailor License Costs

We recommend a reduction in the license fee on the small two or four wheel trailor, not used for hire, and used incidentally with a passenger type automobile.

Farm Bureau Incorporation

Whereas, the present trend of our sister farm bureau federations is toward corporate form; and

Whereas, there are certain valuable services that can be best rendered to our membership if we are acting in said corporate form,

Now, Therefore, Be It Resolved by the Maryland Farm Bureau Federation, in meeting duly assembled, that our Directors are hereby authorized to do such necessary acts as may be necessary to create a body corporate under the name and style of the Maryland Farm Bureau Federation, Inc., or any such similar name.

And Be It Further Resolved that all the assets of the Maryland Farm Bureau Federation be transferred to such corporation when formed.

And Be It Further Resolved that when said acts are done the membership be duly notified through the several county farm bureaus and that the By-Laws of the new corporation be submitted through said channels for ratification.

Commission Rates

We protest the increase in commissions charged on the wholesale market in Baltimore City in excess of five per cent. heretofore prevailing in this market and request our officers to cooperate with the Vegetable Growers' Association to rectify this excessive charge in the wholesale commissions on farm products.

Price Level

The past six years has seen the general price level go from the high level of 1929 to the low of 1932.

The experiences of the past have proved that in an abrupt price level change salaries always lag from 5 to 10 years behind prices. Farm prices today are still out of fair relation to taxes, freight rates, farm machinery, professional services, etc.

During a time that price disparity exists interchange of goods between farm groups and other groups is greatly decreased. Farmers with low purchasing power meet only necessary obligations, their farm buildings and equipment suffer, education and health are neglected and millions of idle men walk the street.

Prosperity cannot return when agriculture furnishes one-sixth of the Nation's capital, represents one-fourth of the gainfully employed labor and receives only one-tenth of the national income.

On May 8 last, Representative Allan Goldsborough of our State introduced an amendment to the Banking Bill which was lost by a vote of 122 to 128. Had this amendment passed it would have made it mandatory that the price level be raised to the 1926 level. It would have created legislation to prevent violent price level fluctuations.

Be It Therefore Resolved, that we re-affirm our position on backing the A. F. B. F. in their program for monetary reform.

We believe that the right time to enact legislation, to restore price

levels and create a managed currency is now while the entire nation knows that the need exists.

Be It Further Resolved, that we send a copy of this resolution to President O'Neal of the American Farm Bureau Federation and to the Committee for the Nation.

Memorial

Since the call of Providence has removed from our midst during the year former Senator R. Smith Snader, of Carroll County, and Mr. C. L. A. Heiser, of Baltimore County, two outstanding leaders in our organization,

Be It Resolved, that we hereby register our deepest sorrow in the loss of our sincere friend and leader, R. Smith Snader, a man of sterling character, a staunch supporter of the organization movement, and a man who was loved by all who knew him.

Be It Further Resolved, that we express our deep regret in the recent death of Mr. C. L. A. Heiser, of Baltimore County,—a sincere friend, a vigorous leader and a sympathetic associate.

Be It Further Resolved, that copies of these resolutions be sent to the respective families of the deceased.

Appreciation

We, the Maryland Farm Bureau Federation, in Convention assembled, desire to express our appreciation of the welcome to Baltimore of Mayor Jackson, and the greetings of the Baltimore Association of Commerce, brought by Mr. Pouder.

We recognize the aid which Mr. McKnight has given in our meetings with his excellent leading of our group singing.

We thank Acting President Byrd and Senator Radcliffe for their presence and inspiring messages. To those who brought messages from our Government—LaFayette Patterson, John Norton and Governor Myers, our gratitude. We appreciate the recognition of our meeting given by the American Farm Bureau Federation in sending its representative, our good friend Joe Porter of Tennessee.

We are grateful for the help of Miss Trentham who arranged our program of banquet entertainment.

We are grateful to the management and staff of the Lord Baltimore Hotel for their fine cooperation.

We extend our thanks also to all others who, as speakers, or entertainers helped make this meeting an outstanding success. We wish to recognize also the long hours and extra efforts of Mr. Nuttle, Mr. Wise, and others on the staff of our State organization in arranging and carrying along the activities of this 20th annual convention.

MEETING OF COOPERATIVE AGENTS

Thursday, January 16, 9.30 A. M.

Chairman, ZACH TURNER, JR.

"Fellow Cooperators—This marks the 20th annual convention of the Maryland Farm Bureau and the 8th cooperative agents' conference in conjunction with the convention. I want to thank you for supporting this meeting and making it a success. We have a number of new faces this morning which shows that our cooperative cause is growing in support. There are untold opportunities and possibilities in this cooperative field and it is up to us whether or not we take advantage of them. I am going to give you three words to carry into your work in 1936—Work, Think, Study. Work is the foundation of success. Work plus thought makes one's work productive. If one does not work, his time is wasted. If he does not think about his work, he becomes stagnant. If he does not study, he will lack sound judgment.

We have Mr. Evans of the Agricultural Corporation with us and I am going to ask him to say a few words in starting our program this morning.

MR. EVANS: Mr. Chairman and friends; I am somewhat at a disadvantage because I see whatever I say is being recorded. I probably will not ramble very far from the real facts.

It certainly is nice to see so many and such a representative group of co-operative agents brought together. However, there is one thought that we might bear in mind, something that I think in our whole work throughout the weeks and years of 1936 will be quite beneficial to cooperative effort as a whole, and that is, although we represent quite a large group here this morning, yet at the same time we are representative of a very small portion of the representatives of the cooperatives as they exist in our State. We have a number of cooperative enterprises. Until I came into this work during the past year, I never realized the real importance and the real job that cooperatives are doing in the State of Maryland. We have a number of local associations. I believe that there is hardly any community in the State of Maryland that is not touched in some way or by some cooperative effort of some cooperative agent, either local or some of the other cooperatives. One of the things that we should strive to do is to bring these representatives of various cooperatives together, and see if we cannot arrive at more or less of a general, definite cooperative program that embraces all of the field of cooperatives throughout Maryland.

The insurance business, of course, is represented by the Farm Bureau Insurance Company. A great many of the representatives are here today. A large majority of you men are in that field. There are other fields in the cooperative market. For instance, we do not have any group of the people who represent that particular thing,—there are a number of associations, a number of organizations that are doing that work, but practically none of them are aware of or are really familiar with the job that is being done by others in the same field. I believe that one think that we can think of is how to bring those together. In the field of cooperative purchasing of commodities we have somewhat the same situation. So, bearing those things in mind I believe that our efforts and our thoughts can accomplish a great deal more if we can some time during the coming year bring them together. I feel a strong farm organization such as the Farm Bureau can accomplish a great deal in doing that, and that in working along our program the closer we can work with that idea in view the more successful our program will be and the more work will be accomplished.

You, of course, probably expect me to say something about the commodity development, the development of the Agricultural Corporation's business during the past year. We have made some advances, and I think that we are on the road to a great deal more. The field is certainly one that gives opportunity for a large piece of work. However, it is going to take the thought and consideration of all of us, and the working out of a program and the development of that program in order to bring about the real benefits that we can get from a real cooperative purchasing program.

I think we are very fortunate this year in having the services of Mr. Weed who has had a great deal of experience in this line of work in Ohio, and others who have studied and worked on this program to help us develop that particular thing.

I think there are two main activities, and during the coming year we want to try to carry out those activities. First, to get together, to bring together the cooperative agents throughout this State under a program that we will all understand and know, so that we will each know what the other is striving to do; and then to develop a real Farm Bureau cooperative for the purchasing of farm supplies. I feel that a much more efficient and good job can be done when we do develop that particular end of it.

I know that we are imperfect, I feel that our services can be improved; we are striving all the time to make those improvements, and we certainly appreciate the suggestions and the help coming from you. We certainly appreciate your effort in preaching cooperation and in thinking about the real Farm Bureau program in cooperation.

So, bearing those things in mind, I believe that 1936 will be a banner year for us. I am not going to speak any longer. There are a number of good speakers on the program this morning who will have something really worth while to tell us. I hope we will take their counsel to heart and really develop the thought that they will leave with us.

MR. TURNER: I certainly do appreciate Mr. Evans' remarks, and I do feel that by the close of this year we are going to have a much closer relationship between all the cooperatives in this State. I feel that it makes no difference what we are selling, whether fertilizer or produce, we must sell the idea of cooperation.

Now, we have a man with us who says he left a good State to come here. But he has come to a whole lot better State. It does give me a great deal of pleasure to present Mr. Art Weed who is in Maryland helping to promote the cooperative movement.

MR. WEED: Mr. Turner and friends of Maryland: This is the first time I have had the opportunity to talk to you in the capacity of my new official position. Several years ago I spoke to you as a representative of the Farm Bureau's Home Office, and I talked to you then about insurance.

Mr. Turner is trying a different type of meeting this morning. We have brought together the different phases of this movement and you will have a smattering of both sides of the picture.. Mr. Bennett, who is to be here,—the train was thirty-five minutes late, and I have to talk until he comes—is going to give you the outlook for 1936 and Mr. Smoots is going to give you a picture of the advantages of representing a cooperative organization, as they have grown to understand it in Ohio and in a good many other States.

It is not necessary for me to repeat to you insurance men a good many things I have said in various meetings in Maryland in the past. We want to bring together some of the ideas of the different groups and work out some program as a solution to a good many different problems.

Now, a word of my impressions, first impression,—I reserve the right of changing my mind,—in regard to relations in Maryland. So far, I have this thought in mind,—that the people in Maryland, the farmers in Maryland do not yet realize all the things that the cooperative movement can do for them. The insurance agents can do a great deal in building up our cooperative program. I say that not in a critical spirit at all. I say that there is a reason for such meetings as this of the joint interests of the cooperative forces of Maryland. There is, in my opinion, one of the greatest opportunities of cooperative development in Maryland of any State that I know of, and upon how well we live up to the opportunity, how well we learn to work together in the cooperative movement will depend our future success. That means we have to do some studying of the other fellow's job. It means that in that study and work that Mr. Turner sug-

gested to you this morning you are going to have to consider not only your own individual needs, but what effect your individual job may have on the general movement. I read one of Mr. Peck's statements not long ago. He touched on the old phase of cooperation meaning working together, and he threw a new light on it. We usually say cooperation means working together; he changed that to read "Cooperation is working together." And it is going to take considerable of that working if we are to live up to the program prepared. We have during the past few weeks, Mr. Evans and myself, been working on a program of building the cooperative commodity work in the State along with the Farm Bureau work. I think most of you insurance men know that I have had some connection with the Farm Bureau plans and am acquainted with what they are.

I believe that the commodity program in Maryland needs a great many of the points contained in your insurance sales program. I know they will work in that regard. I have seen them working. You insurance agents can help the Farm Bureau a great deal and the cooperative program which we are arranging. You can help us to accomplish some of the sales principles in the Farm Bureau work that you have been applying in your work. We want to sell the cooperative program in Maryland.

Among the things that we are planning for the coming year is a very definite program of merchandising, which, with all due respects to the past, I do not believe the Agricultural Corporation has had. The principles of that merchandising program are pretty closely related to the same principles that we have used in building the insurance sales program; those same old principles that we have been talking about for so long apply equally well to the cooperative movement. We want to get in the minds of all the people an understanding of what we are working for in the cooperative movement. At one of the sessions of the Livestock Marketing Association, one of the men made the statement that the agencies had been established and he was satisfied, he thought his work was done and the livestock problem solved. It was not, it was just started because the establishment of agencies as such do not guarantee the success of those agencies until we get in the hearts of the patrons the real need for those agencies. We must instill into the hearts and the heads of the members of the Farm Bureau an underlying belief in the cause they are working for. When we do that, nothing can stop the achievements of the Maryland Farm Bureau or the Maryland group. I see that one of the good speakers has arrived, and I am ready to quit.

I know most of you insurance men, I have worked with you in the past. I hope you will come to see me any time you have a suggestion to make. I know that I am going to come to you and ask for help in the correlation of the work in the Maryland Farm Bureau in our cooperative program.

MR. TURNER: Mr. Weed is a real cooperator. He has helped us in the insurance field in the past, and I know he is going to help us to promote the cooperative movement in Maryland during the coming year. Our next speaker on the program is Mr. Cooley, but I see that Mr. Green, the President of the Bureau, has come in and I am going to ask him to say a few words to us.

MR. GREEN: Mr. Chairman, Art Weed, and Maryland cooperatives. I should not have come in and come up on the front row. I am neither Mr. Cooley nor Mr. Moon.

I am glad to have this opportunity to come out to this eastern country and mix up the friendships of the Bureau between the West and the East, and mix up the Yankee Dutch of the Western border with the Yankee Dutch of the East. Those combinations have made up a good deal of Ohio, and while we perhaps have thought throughout the years that we did not have so much in common I think that as the years have gone on and we have come to look upon our problems as national problems we have come to know and realize that there is not much difference at all between the way we have to do things as we get out into the Middle West and the way that things have to be done over here.. I am glad to know that we can join hands in a common cooperative service.

There is probably no greater movement that exists in America today than the cooperative insurance movement. It has, first of all, a common nation-wide basis of service as its motive. It has, in the second place, a common nation-wide motive in the cooperative way forming the background for financial stability of the cooperative movement in its message throughout America.

The National institutions as represented by Insurance Companies are the second largest financial institutions in the country. We perhaps do not realize that fact completely until we examine a few striking examples, —evidence which conclusively proves that statement. Why was it that one of the banking interests of the East paid $3,000,000 for $100,000 worth of dividend liquidated stock? It was because the immense assets behind that organization were through that purchase put in the hands of those who could use it to good advantage for their own institutions.

Now, I think that you men who represent agencies will first of all work much more efficiently if you approach the problem of offering insurance as a service,—if you approach the problem of offering insurance as a service, if you approach it with a common knowledge, a viewpoint of its National significance and stability and its effectiveness on our future economical program in this country. We have not yet touched the field of insurance in its—perhaps its broader and more significant social basis. We have not yet touched the field of insurance in the more common social service, and history the world over is proving that. I think I am

safe in making this statement,—that all of these forms of social insursurance, all of the forms of social security that are now important in our National thinking will eventually be performed though a cooperative service. Some of the far Eastern countries are finding that social security that is handed out as governmental, through government means, is not going to work. And so I say that we have in this great field of insurance all of those phases of our whole social program yet to take up.

Now, I do not know what these other fellows are going to say, but if they repeat, it will be all right, but let me say this now in support of the organization that we represent here today,—whether you know it or not, it is the biggest, the greatest cooperative insurance movement in America. There is nothing like it in the whole world in its cooperative significance except the insurance service offered by the British Wholesale Cooperative Societies as a group. We have had more assets in ten short years to get back of the cooperative movement of America, to accumulate in America, than any other organization that is put together, and it has already that financial support of its membership and of cooperative societies, which is already a part of the program.

Now, I see that all of the speakers that are supposed to be on this program are here, and I am going to quit.

MR. TURNER: Thank you, Mr. Green, for your remarks. I am sure that we have all received a lot of valuable information from those remarks from Mr. Green and we are sorry he just decided to quit. I do not know any man in the whole organization that we would rather see than Uncle George. We see his name signed on the bottom of the policies. He is not only a friend to the Ohio Farm Bureau, but a friend to all, Mr. George Cooley,—Uncle George we all call him. He brings greetings this morning from the Home Office to the Maryland Agents.

MR. COOLEY: Thank you, folks you had better wait for that until later. I am pleased to be here for various reasons, first, because there are quite a number of familiar faces that I see here. My first trip to Baltimore was in the 90's; that is before the memory of a good many of you here.

I want to say that I have no speech outlined. The boys on the train tried to tell me what to say, but I would not say all they tried to tell me. We have another man, a good speaker, he has a great big speech which he had tucked under his arm, he will give you some of that.

It is a pleasure to be here, and I want to say that we are pleased to note in the reports that come to us from the office here and through our Home Office that it is very pleasing when we find that you have brought something over 13,000 policy holders in this State,—I cannot tell the exact number. I got in just in time to hear our President, Mr. Green, speak of some things. We believe there are two things that ought to be done in this particular meeting. We think every insurance agent ought to be a

Farm Bureau member as well,—whether that is true or not is for you to solve. It is a permanent organization in every State, and I believe it should be encouraged. I think you have something like 125 agents here.

MR. TURNER: 137.

MR. COOLEY: Well, I am a Yankee, so I have to guess at a lot of these things. We want to extend greetings to each and everyone of you. We will not take up any further time. I want to shake hands with everyone here. I brought greetings from the Home Office to you. Now, how many of you remember a Claim Agent who used to be here by the name of George Tanner? His wife, Mrs. Doris Tanner, asked me to say to her friends, extend her greetings to you. She is a member of the same community in which I reside when at home at Dover Centre, Ohio, just out of Cleveland. She especially requested me to say that to you.

MR. TURNER: It certainly is a pleasure to have you with us this morning, Mr. Cooley. I think it is the first time you have ever been on one of our regular programs with us.

Our next speaker is a man who has never been in Maryland before, at least he has not attended any of our meetings. He is going to talk to you on "The Latest Development in Cooperative Insurance." He is well qualified to talk on that subject, not only for the fifteen minutes allotted to him, but from now on until we have the banquet tonight—Mr. L. A. Taylor.

MR. TAYLOR: Mr. Chairman, and folks: I have no particular set speech. That big speech Mr. Cooley was speaking about I had written for him and he would not make it, so we left it down in the hotel room.

There are many interesting things going on in the way of development in Cooperative Insurance, many things for us as pioneers in our own Farm Bureau insurance to give thought and heed to in the way of development. I do not know any more that I could add to what Mr. Green has said. He took in the whole world. He said only the foundation had been laid, he was right. There are many things going on. As you folks probably have heard within the past three or four months, we acquired a life insurance company just as we did a fire insurance and an automobile insurance company. We are endeavoring to adapt that company to the cooperative program, to recognize the needs of the farmers in the way of life insurance. Now, I do not make the statement as to Maryland, but over in Ohio and in some of the other States where we have studied the situation we know that this fact is true,—that farmers as a class were never over-insured so far as life insurance is concerned, and during the past few years many of the farmers who did have life insurance had to drop it because they could not continue the premiums.

We are trying to be conservative in the program that we are getting out and at the same time endeavoring to put rates down to the price that

we feel will be suitable to the farmers' needs and ability to carry on. So, within a short time, we hope to have that service available in your State along with other States in which our Casualty Company is operating.

It rests upon us, each and everyone of us is responsible to properly and carefully select those whom we extend our service to, watch our policyholders after they have been admitted to the automobile company, and if they are not the proper risk get rid of them. Any bad risk in this company simply takes that much money out of your pocket, out of our pocket. If we will do those things, there is no question in my mind about our ability to go on and on and to expand a good deal with some of these other developments that we have the opportunity to acquire, if it is to the best interest of the company. I think that is my contribution this morning.

MR. TURNER: We certainly do appreciate Mr. Taylor's remarks, and I hope he has answered all of your questions in life insurance. I am going to assure Mr. Taylor that during 1936 we are going to spend more time in selecting our risks than we have done in the past. We now have a man whom I am not going to introduce. We all know him. It is certainly a real pleasure to see our sales manager back with us because we know he has been sick for some time. I know he is just as glad to get back to Maryland as you are to see him. Mr. Bennett—

MR. L. J. BENNETT: Mr. Turner, friends: I think Mr. Turner is right when he says I need no introduction to this group because, after all, I have been a Marylander, even though I am not a Marylander at the present time. I can at least claim a relationship to the State of Maryland as one of her children. I do not have to worry about what I have to say as some of these other fellows. Mr. Smoots and I have worked together and he said he would take up anything that I left out and give it to you, and so I do not have to worry. When I see this group, I am reminded of a story that some man told me,—in my mind it really fits in. An old farmer came home to dinner one night and sitting round the family table he announced to his family that he was going to enter old Maud, their old mare in the trotting race. Of course the whole family was very much surprised. The mother spoke up and said "Why, Daddy, old Maud is nothing but an old plug. The horses in that race are all registered horses, regular racing horses. Old Maud does not have a chance in that race." Their little boy spoke up "Why, it will cost us $20.00 to enter old Maud in that race, and she does not have a chance." The old man says "Well, I have made up my mind, I am going to give old Maud a chance. It is worth $20.00 just for her to travel in such company as that."

So, this morning, it is worth a whole lot to me to come back to the State of Maryland and associate with you good people. I am glad to be here, and I hope it will not be quite as long between this visit and the next as it has been since my last visit.

First, I would like to give you just a slight review of the accomplishments in 1935, though it is not quite complete. For instance, for the State of Maryland some fifty-five or fifty-six coverages which were supposed to be written did not quite reach that budget, but we missed it by such a mere margin that we really cannot kick too much. Last year we had in Maryland 5,396 new coverages, and that does not include the production for Delaware. However, during that same twelve months you wrote 4,333 coverages and there were quite a few coverages impossible to reinstate. Of the 4,333 coverages you were able to reinstate 1,659, giving you a net gain of 2,752 coverages for the year. If we reduce that to policy holders we get somewhere around 1,500 policies. I think you are to be congratulated; that was an excellent job. However, we have a job just as large, if not larger facing us in the year of 1936. We have a budget in Maryland of the same number of new coverages that we had for last year. I believe that Mr. Turner is going to see to it that when Jan. 1, 1937 rolls around rather than being 300 coverages short of the amount you will have 300 over. I am not worrying, I know that you men will go out and determine to write that budget for the year of 1936 before it comes to a close. We are going to sell life insurance, if possible, in Maryland before the year is over, not the next month or six months, but we hope to have it just as quickly as we can arrange for it and it takes time to set up an agency and to get ready to begin to operate, but before the year comes to a close we will have written a nice volume of life insurance in the State of Maryland.

We have talked, many of us, have studied during the past twelve months if not longer, quite a bit about the consumer cooperative program and the cooperative program in general. Our Board of Directors a few months ago passed a resolution agreeing to offer our insurance service to consumer cooperative groups throughout the various States. To give you some idea of the number of consumer groups that are organizing over the various States I do not believe hardly a week passes but what some new group writes into our Home Company to ask about our cooperative insurance. It is nationally and inter-nationally recognized as the cooperative insurance organization. Just this week I had a letter from a consumer group in Boston. We get inquiries from groups all over the eighteen States in which we operate,—in fact, practically in every State in the forty-eight States. They all want to find out more about cooperative insurance, especially the consumer cooperative.

By the way, if you men want books, pamphlets or magazines that you may need in order to acquaint yourselves with what is going on in the United States as well as the foreign field, I am going to ask that you ask Zach Turner to get those for you. You have to pay for them, we have to pay for every one, but they are well worth it; they are a good investment. A few cents for a pamphlet or magazine will pay you more times and a larger number of times dividends than any other investment you can make,

because you can use it to a greater degree than you have ever used it before in the sales presentation that you make out here in the field. We do not use it half as much, none of us use the cooperative side of our sales presentation half as much as we should. In other words, too many of us go out and call on an insurance prospect and explain the insurance proposition just the same as any other, and yet we are entirely different, separate and apart from 99 out of 100 other insurance prospects. We want to be different, we want to continue to be different, and if we only explain that difference to the prospect and give him the opportunity to find out why we are different, we will make more sales. That will help you more in your selling work than any other one line of approach that you can follow in your sales presentation. Mr. Turner may not have these pamphlets that you want, but I guarantee if you ask for them he will get them for you. We will see that he has a list of them, ample to furnish them to you.

Let's not forget in any minute or any hour that we spend in the work out here in the field that we are rendering service to our fellow men; if we forget about the commission itself, don't forget about rendering service, and think of it from the standpoint of service that you are rendering to your fellow man, to your neighbor; then the commission part will take care of itself to a much greater extent than it would otherwise if you try to go out and work entirely from the commission standpoint. Every insurance agent in the State of Maryland should make it his or her particular job during the year of 1936 to acquaint himself just a little bit better with the company that he represents, the principles of that company, the policies that company offers. I venture that a lot of us who have been selling insurance for many years forget to go back and read the policy over as we should, we forget a lot of little details that actually mean a lot to you and your prospect and should be explained. If you go back and re-read those policies and acquaint yourself with them and bring them up to date, you will find a great improvement. Let's make the year of 1936 a year of progress and of industry; in order to make progress we must have more industry and render as much service as possible in the cooperative way to the Maryland Farm Bureau, to the members of the Maryland Farm Bureau and to the good folks living in the State of Maryland.

MR. TURNER: Mr. Bennett has outlined the future development of this cooperative development. I have a lot of pamphlets on cooperating and they are available at the Maryland Farm Bureau.

Our last man on the program is General Sales Manager. He at one time was our sales manager for the Insurance Company. He is a real cooperator, as most of you know him well. It gives me pleasure to introduce to you Mr. H. W. Smoots who will speak to us about "The Advantage of Representing a Cooperative Organization."

MR. SMOOTS: Mr. Chairman; I believe the program so states, but you folks have all been sitting here for some time. How would you like to take a little trip with me? (The audience arose and turned from left to right and around and extended their arms under the direction of Mr. Smoots.)

One man in our group says the speaker should learn to stand up, speak up and then sit down. Now, I am going to depart somewhat from the subject assigned. After all, the subject does not mean particularly anything, just something to put down in print.

I want to say the thing most applicable to the general line of meeting. I do not want to be in the position of having to say "I told you so" because, when I did make a statement before,—I told you before that while I was not a prophet nor a seer, that I did predict that we would have the biggest wave of cooperation in the next few years that we have ever had. I explained my position in reference to that by saying that as long as times were good, money plentiful, business flowing in, credit easy then we just never stopped to think of what made the wheels go round. But when we were faced with the situation that the wheels ceased to go round, something was wrong with the machinery and we had to stop and think. We had to do something, the money had stopped coming in, and credit was not easy; in fact, there was no credit at all and we had to stop and think. When I was talking to you gentlemen at that time, I had not the slightest idea that the thing would go to the extent that it has gone, nor that it would go into the places that it has gone. When I speak to you of cooperation, I am speaking of the Farm Bureau because your Farm Bureau represents the cooperative movement in general. It is the medium for the development of the economic cooperative system; so, when we speak of cooperation, we are speaking of the Farm Bureau in its various phases. It has not only gone to the farms, but it is going into the city. Our city men, our doctors, lawyers, leading men, clerical workers are all thinking of cooperation because they have met the situation the same as we have met the situation. Out on the farm we stopped to think that something was wrong with the economic system that we have at the present time.

Now, let's think for just a moment,—just what is the cooperative movement? I like to think of it just as the law of living. It touches our social, our economic, and even our religious life. It works in all those phases. Did you ever stop and think of the situation as it is at the present time, think now of your home life and your social life in comparison to your business life? What do we do in our homes? What do we do with our youngest child, what do we do with those aged parents of ours, or those members of the family that are sick, the weaker ones? Do we push those aged ones aside and take what we want when we go to the table? Do we crowd out the little one and say "After we are through

you can have what is left, if you can get it?" To the sick one, do we say "We are all right, you can take care of yourself?" Is that our home life? Far from it. Those are the ones that we save and protect and sacrifice for, our time, our effort and money, everything else, to protect them. But when we step out into the business world, there we find the rule is every man for himself. If there is a fellow out here a little weaker, push him to the side. If a fellow is in a bad financial situation, the general policy is to take advantage of him. In other words, living and life in our homes is ideal, but when we go into the business world, the strong win and the weak get the little end. That thing has broken down. Now, then, when I say cooperation touches our social, and religious and public life, I mean we have got to make some changes in our whole system in order that we may work together in a cooperative way. Our social, our economic life should not be so different from our home life. You may say that is idealistic, and it will never come to pass. Perhaps it may not in our time. But we have just worked our way through one depression and they are predicting another one in 1942,—that is something to look forward to, so we are thinking this morning primarily of economic cooperation. We are thinking about automobile insurance, thinking about the Farm Bureau in its various activities, legislative, economic, the distribution of feed and fertilizer. You are thinking undoubtedly about your dairy situation, your purchasing situation here in the State of Maryland, all the phases that pertain to agriculture, and after all we cannot segregate agriculture from the city. After all, agriculture is the basic industry of the nation.

So, thinking about the economic end of it, there is something I would like to discuss,—the economic end of it for just a little while. You may not agree with me, I shall not be surprised. But if I can get you folks to stop and think, do a little thinking,—not worrying about the fiscal year and how it has gone and how it will go and what your part in the whole program is, the general scheme of the program may be. Let's for just a brief moment think of the cooperative movement. It is primarily new to us because, after all, the economic end of cooperation is the demonstration of it, the putting of it into actual operation and proving your theory. Now you have certain fundamental principles that underlie cooperation, economic cooperation. One factor is the distribution of ownership—in your various organizations the cooperative angle of one vote per member rather than one vote per share, a democratic control. Next it does not regard race or religion. It reverts back, it eliminates the profits and substitutes for the motive of profit, the idea of service in business. There is no profit in cooperative business. Why? Because the group or the business men that are doing the business, are doing it with themselves;—therefore, it is not logical to expect that you are making a profit out of your own business. But you are creating savings, and these savings revert back in proportion to the amount of business done. Be-

cause you have maintained a standard of prices, you have effected economies in the management of this and that point, and the result is that when you get through and total up your six months or your year, what do you find? Perhaps you have charged yourself too much in this matter or that, charged yourself more than enough to cover the overhead; therefore, whatever is left over is just that much too much that you have charged for the things, and you must put it back. That is your cooperative principle. Insurance, as you know it, does not operate on that basis because of the set up, and advantage is gained immediately because of the lower rate in comparison to your competition. And we hope we can see that the risk, the type of policy holder and their mutual interest in the company are holding down losses. We will have 135,000 policy holders cooperating, paying their own bills through their premiums. When they do appreciate it in its true sense, then they will begin to appreciate the fact that a little more careful driving will help to hold the rates where they are, or cut down those rates. So, the economies that come or the savings are given advantage at the immediate time of purchasing, and when we buy feed, fertilizer, spray material and one hundred and one things in a cooperative way, there is a tremendous saving. We have a long way to go yet. You may be able to cover that way in a very short period of time, I hope you may. There is a real opportunity here in Maryland for that. I haven't the figures here this morning to give you of the tonnage of fertilizer used by the farmers in Maryland, of the amount of feed used, amount of spray material, and all of those things. First, you want to correct that bad business prejudice that exists, and the second thing you want to do is to control and regulate business. Do not figure that competition in, do everything you can to cooperate just as economically as any other organization, but then remember this,—that your competitor will never do it unless it is forced to do it, and you will find after you have accomplished the first point you have the second thing, the control, and you will always need it to control. There is a tremendous opportunity there.

Now, let's take something concrete. I will take you back to Ohio, if you will permit,—not to a large county, to a county that is no better than the average county in Maryland, no greater possibility, no better farms,—in other words, I would say that it has no distinct advantages. It has a Farm Bureau organization with a good membership. In the year of 1935 they have done better than $500,000 worth of business in that county with some 2,000 farmers. They bought their feed, their fertilizer, their spray material and all of the things that those farmers might need, even down to building material. They have gone a long way, but they have not yet eliminated all competition. They have made the first step. They come in and talk to their manager,—"What is my produce going to cost, the wholesale, not the retail price?" That is the selling price, the prevailing price in that county. That organization of farmers through their cooperative association is regulating the prices in that county. Now,

then, the other day we started a rural electrification project in that county for the farm homes. We will have to get an expression from those farmers in that county. That brings out a very interesting point. They had an excess supply of potatoes over there, the market had no great demand, and those farmers were having difficulty in getting rid of their potatoes. The result was they began to come in and ask "Haven't we got a potato marketing program?" The manager said "Yes." "Well, why don't we market cooperatively here in this county?" The manager said "All right, we will do it." So they went out to the farmers, their neighbors, and they said to them "We are going to market potatoes through the Farm Bureau." The others said "If the Farm Bureau is doing it, it is all right. We are with it. We know it is all right." They have a great confidence in the Farm Bureau out there; if the Farm Bureau was back of it, they were ready to go ahead. That is tremendously significant to me,—whether it is the potato market, or whether insurance, or anything else, if they want to market it from a cooperative standpoint they have demonstrated to themselves they can do the job in that county. If the Farm Bureau puts its stamp of approval on it, it is all right. I wonder if that sentiment were all over the State of Ohio as it is in that county, if your job of selling automobile insurance would be any easier. I wonder if it would be any easier to sell fertilizer or feed or spray material or anything else. We want to get the support of the farmer back of our organization. I wonder how our life insurance program would work out if you had that confidence out here among the major portion of your Farm Bureau.

Now, let's take that same county, and find where they buy their commodities, where do they buy their feed, fertilizer, etc., and where do they get their insurance? Through their Farm Bureau and through their State organization, because they appreciate that their State organization is their organization, not separate and distinct from them, but their own. They control it, and they know they have the power and ability to make progress in that organization to buy the things that they consume. Sometimes you farmers find that you can buy your produce, your feed, your fertilizer cheaper outside of your organization because your competitor is willing to lose some money on you and then stick the next fellow to make it up. That is what they do. They know that the State organization is going to purchase effectively at wholesale, and they go to some fellow and ask him to go down and tell us what they are charging. Let me give you a little example in cooperative purchasing. We handle a certain commodity that the farmer uses quite extensively in the State of Ohio, have handled it for a number of years, have a fair volume of business, nothing to brag about, or to write home about; we were getting just about enough profit to pay its proper share of the overhead, nothing to be gained, no savings to be created to revert back, just about breaking even on this item. Soon after the Code went out of existence,—you Republicans certainly played hash with the N. R. A.,—that company that had been supplying us came

around to see us, and they offered us certain terms, and they said "You can take it or leave it." There is a certain psychology in saying that, you may have to take it. Well, the position we were in was pretty hard, and we began to scratch dirt. We got in touch with another supply company, and before we got through we got margins on that commodity that we did not believe existed in it, because we found out about 50 per cent. of that supply company business was going through our distributing channels; if they lost that business it would mean a lot to them. The result was that we got ten times more margin on it. That commodity is not only going to make its overhead, but is going to make a substantial contribution to the savings of the State and County organizations. Where did that margin come from? How would we have got it? We would never have gotten it in the county,—only by talking in a State-wide way.

The other day,—I was telling you we were considering electrification,—we knew that some of our farmers were going to want household appliances, so we went out to see where we could purchase them. We had no idea of how much they would cost. Our purchasing agent came in and said "Well, I can buy appliances at 50 and 33⅓ per cent. off." I said to him "Get another 50." Yesterday he came in and said "I have got 50, 33 1-3 and 25 per cent. off. How much farther shall I go?" I said "Well I will be reasonable with you, I will split the difference with you." That 50, 33 1-3 and 25 per cent. off just makes a $5 electric iron cost us between $1 and $2, and I do not know whether we have enough discount on that yet or not, to be honest. Now, how did we get that?—through cooperation in a State-wide way. Now, when your membership begins to understand the workings of your cooperative program, it makes the job of everyone easier,—easier to get the community business, easier to get membership, easier to get legislative action. You have to get a program and get the support of the membership back of it, and when you get that, your job is much easier. It makes a relationship easier all down the line. I could go ahead and talk for a long, long time on those things. You know the difficulties, and I do not like to point out the difficulties. The difficulty is for you and me to put it into actual accomplishment. That is the difficulty we are experiencing, because, after all, it is built on confidence and we have ceased to be a people that buy. We are sold, did you ever stop and think of that? You do not buy, you may consider it buying, but you are sold, and you are sold beautifully. I could not help but think when thinking about those electric appliances with margins of 50, 33 1-3 and 25 per cent. off, what has the dear public been getting in the past,—where have those margins of profit gone? A large department store in our home city, after paying its executives and employees their regular salaries, and these employees got salaries larger than you and I are getting,—I do not mean the whole group, some of them did,—they had some $800,0000 in net profits. Now, where did that go? It went back to the stockholders, and that group of stockholders was very small. Now, if that $800,000 had gone back to the customers that made that business

possible, what would have happened? They would have had $800,000 more business for that organization, everyone would have turned around and gone back and bought something more, taking the savings and putting it right back into purchasing power. There is a story in itself. You and I have not only been sold but we have been paying more than 40 per cent. more for the stuff we buy than we should. Now, then, what relation has that to insurance? As we develop this cooperative organization at the present time we are primarily taking it from the manufacturer and putting it through the distributing channels. That is going to change I am afraid; they will have to go back and cut the manufacturing end to some extent,—how far I do not know,—how soon I cannot tell you. We may never see it, but, bear in bind at least, that that is going to happen. Now, then, in the distribution of investments, the one thing that is troubling the Insurance Companies is where to invest that money. Where is a good, safe place to invest it? I believe that opens up a field of thought, as we build this insurance department up, we will be able to take those receipts and invest them in our own cooperative enterprise at a reasonable rate of interest. We will begin to build our own market.

Now I think I have talked on about this cooperative movement enough, but I want you to study it, think about it, its actual application; then, when you go into your own county, you will see some of the things I have been talking about here. Don't become discouraged, take it as a challenge. You are the advance guards as insurance agents. Then we will come along and build and as we build we will do as good a job as the other fellow is doing. We will have to clean up our own steps, brush up on our sales presentation, our advertising, we have to challenge the other fellow. But if we build up a cooperative program, I predict we will not have so much to fear in 1942. The responsibility is ours. We must have a better distribution of the wealth of this nation and State.

Let me leave this thought with you—we have been thinking of ourselves as producers—whether we were clerks in an office, or a farmer, or an executive or a day laborer, we have been thinking of ourselves as producers. Are we or do we produce as the method of getting the edge of exchange so that we can spend and get the things that we consume? Is that what you work for? And the more we get the more we spend. No, it does not work quite that way for us. Pass this question on—are we primarily producers, or are we primarily consumers, and should we approach this whole question from the consumers' standpoint rather than a producer's? What have you had in Mayland? What has been your success in your cooperative ventures? Have they done what you hoped for? Have you approached that question as a producer or as a consumer? Think of that when you try to perfect your methods of approach.

I am glad to have the opportunity of being here in Maryland. The last time I was here I just missed your meeting by a day. This time I missed

it by a half hour, but it was the train's fault, not mine. I am happy to be here. You folks have done a splendid job. You have a lot more to do, you have the man power, the ability, the approach. Success to you in what you may do!

MR. TURNER: I want to tell Mr. Smoots that we are just as happy to have him as he is to be here. You know that he has outlined methods of representing our cooperative organization. Let's talk cooperation in all of our selling. I hope you all have received a lot of valuable information to take home with you to help you in your work. Let's talk more of the cooperative movement than in the past.

We will now hear from the President of our Fire Insurance Company, —Mr. Odaffer.

MR. ODAFFER: Mr. Chairman: I was not expecting to say anything. I am mighty pleased to be in this meeting. I have been through your city a number of times, but this is the first offense when I have landed.

There is just one thing I want to mention. Mr. Smoots spoke about the importance of confidence and cooperation. I just want to mention one little instance where confidence has a good deal to do with our success. Early in 1934 we started the fire insurance, with the aid of the Farm Bureau, and the activities of the Farm Bureau have enabled us to write property fire to the extent of over ten thousand applications, something better than thirty million in coverage in property fire insurance. I want to assure you that if we had not had the assistance of the Farm Bureau this could never have been done. That is a thing which no other company has ever done,—to write that amount of property insurance in that length of time.

MR. TURNER: I certainly do want to thank each and every one of you for taking part in this progrom. Each and every one of you has given us much to think about.

I want to ask this group to give these visiting gentlemen from Ohio a rising vote of thanks. (Rising vote.)

The meeting is now adjourned.

PROCEEDINGS

OF THE

THIRTY-EIGHTH ANNUAL MEETING

OF THE

Maryland State Horticultural Society

Hotel Alexander, Hagerstown, Maryland

January 7, 8, and 9, 1936

The meeting was called to order by President Fulton W. Allen, who requested the report of the Secretary-Treasurer.

REPORT OF THE TREASURER

By A. F. VIERHELLER

College Park, Maryland

At the beginning of the year 1935 there was a cash balance in the checking account of $270.65 and in the savings account $140.48, a total of $411.13. During the year, cash received amounted to $677.65, and cash paid out totaled $722.41. The interest on savings was $3.85, giving cash on hand January 1 as follows: Checking account $225.89, savings account $144.33, total $370.22. I ask that the books be audited.

REPORT OF THE SECRETARY

By A. F. VIERHELLER

College Park, Maryland

The past year has taken from us four members who have made their mark in Maryland horticulture, and those of us who knew these men feel that we have lost fine and sincere friends. On September 18, Mr. F. A. Lazenby, of Edmar Farms, Randallstown, died from the effects of an automobile accident. Mr. Charles K. McCaslin of Cockeysville passed away on September 23. Col. A. L. Sisk, former president of this Society, died on July 26. Colonel Sisk was one of the pioneer apple growers on the Eastern Shore. Mr. Aaron Newcomer of Ringgold passed away on November 13, and his death marked the passing of one of Maryland's best-known peach growers of the older days.

It is needless to go into the problems the fruit growers have had during the past season, except that the severe freeze of late January cut the peach crop in half; the pre-blossom stage of apples was ten days to two weeks long in some orchards, and there was rain and cool weather that resulted in considerable scab; there was a heavy June drop and for a time the crop was believed very short; the codling moth was checked considerably by weather, but there was considerable sting on the fruits by the small worms; dry weather, spray russet, fruit cracking, and a slow market added to these other items, makes 1935 stand out as a year that had its problems. However, it was one of the best years for a long time, as far as the strawberry growers are concerned, as drought injury to the competing crops in the Middle West brought the Maryland berries onto an almost open market, with slow ripening season.

The Maryland State Horticultural Society has been active during the past year, working with the Eastern Apple Growers' Council, which is composed of the officers and executive committees of 17 horticultural societies. The Executive Committee of our Society met once in Baltimore. As a result of the combined efforts of the societies through the Eastern Apple Growers' Council, some changes favorable to the fruit industry were made in legislative bills regarding marketing, transportation and the pure foods requirements of fruits.

In connection with my duties as Secretary of the Society and as Extension Horticulturist, I have endeavored to help the fruit growers with their problems and have tried to handle all matters to the best advantage of the industry. Other duties consisted in editing the "Maryland Fruit Grower," the monthly news-letter of the Society, and in planning the annual summer meeting of fruit growers. The meeting was held this year on July 16, at which time we were the guests of Gardenhour Brothers, Sam Lane and Eldred Rinehart. Exhibits, demonstrations, a short orchard tour and a speaking program were parts of the day's program, but the fine lunch served was perhaps the most pleasant event of the day. We are deeply grateful to these men who made our meeting so successful.

We welcome out-of-State growers at any time, and hope that all of our guests will enjoy this program, and will take time to see all of the exhibits. The machinery exhibits are located a few doors down the street in the garage of the Hagerstown Auto Parts Company. The other commercial exhibits are in the hotel sample room, and the educational exhibits occupy three parlors on the mezzanine floor. These exhibits have taken lots of time, labor and thought, and you cannot well afford to miss them.

PRESIDENT'S ADDRESS

By FULTON W. ALLEN
Salisbury, Maryland

As chairman of your meeting last year, I laid considerable stress on the fact that we had a desirable place to hold our horticultural meetings at College Park. However, attendance at College Park, as elsewhere, has been disappointing. Consequently, your Executive Committee felt that it should at least try the experiment of holding the meeting near the center of the fruit growing industry in order that more of those who do their own pruning and spraying would have a little better opportunity to hear the discussions.

It has been only a few years since the main function of this Society was the discussion of problems of production. These problems are still with us, but later the question of marketing was emphasized above that of production. This is still vital, and yet another question confronts the fruit grower, the main features of which are but dimly realized. The year 1935 may prove one of the most momentous we as fruit growers have had to face in regard to our relations with governmental agencies.

The question of production will be handled by competent authorities in the course of our program.

Preparation of fruit for market is a question, the main principles of which are generally understood. The marketing of apples, the advertising of which has been given considerable attention, is still a problem. With the Pacific Coast annually spending many times as much as the Eastern fruit growers do for advertising, it is doubtful that we can permanently dispose of the question by contributing a few dollars to obtain the publication of short articles in magazines of small circulation.

The relation of the fruit grower to his State and national Government is of most vital importance. The fruit grower has in 1935 had to spend much time, which might have been devoted to the management of his orchard to fight legislation detrimental to his interests. We must recognize that the Government is maintaining the Department of Agriculture and the Agricultural Experiment Station, some of the agencies of which have been and are of undoubted value to the farmers and fruit growers. Sincere efforts have undoubtedly been made and some results have been realized in arranging reciprocal trade relations of value to horticulturist. Yet we should not lose sight of the fact that taxes probably are going to affect those engaged in horticulture to a much greater extent than at present. It is for us not only to maintain our organization, but to add to its strength and efficiency. This means that for purely business reasons we should support this our Horticultural Society to the best of our ability.

Appointment of Committees

President Allen appointed the following committees to serve during the meeting:

Auditing—Lloyd Balderston, Colora; A. L. Towson, Smithsburg; M. D. Moore, Hagerstown.

Resolutions—W. Lee Allen, Salisbury; E. C. McFadden, Hagerstown; Carlyle Barnes, La Plata.

Nominating—E. D. McCain, Frederick; G. S. L. Carpenter, Hagerstown; J. H. Wilcox, Easton; Edmund P. Cohill, Hancock; Fred R. Sloan, Lonaconing.

THE RELATION OF FRUIT THINNING TO SIZE AND COLOR OF FRUIT AND THE BEARING HABITS OF APPLE TREES

By L. A. FLETCHER

Bureau of Plant Industry, U. S. Department of Agriculture
Washington, D. C.

The annual production of well-colored and marketable-sized apples is the desire of all fruit growers. The work that has been done in and around Hancock, Md., by the U. S. Department of Agriculture for the past four years was planned to determine whether this could be accomplished. The varieties used have been too numerous and the experiments have been too varied to try to discuss each separately. The present paper will deal with the results obtained from each variety separately, in so far as thinning may affect annual bearing of trees and size and color of fruits. The varieties used were Yellow Transparent, Jonathan, Delicious, Stayman Winesap, and York Imperial.

Yellow Transparent.—The consensus of opinion of all growers of this variety is that a tree, to be profitable, must produce large-sized fruits and should produce them regularly. Further, it is generally conceded that a young vigorous tree does produce large fruits while an older tree produces, generally, small fruit. The crop capacity of a young tree as compared to an old one is rather small, that is, a young tree generally has a greater leaf area per fruit than an old tree.

Beginning in 1933 and continuing through 1935, a group of Yellow Transparent trees were thinned to 50 and 100 leaves per apple about 25 days after full bloom; comparable trees were left unthinned.

At harvest time the trees thinned to 50 leaves per apple had an average of approximately four bushels of fruit, of which 80 per cent. was above two and one-half inches in size. The trees thinned to 100 leaves per apple yielded about three and one half bushels of fruit, of which 89 per cent. was above two and one-half inches in size. The checks yielded eight

bushels of fruit, only 15 per cent. of which was above two and one-half inches in size.

During 1934 the same group of trees was again used. The check trees showed no bloom and, as a consequence, no crops. The trees which were thinned to 50 leaves per apple in 1933 showed a six per cent. bloom and 80 per cent. set giving an average yield of four bushels. The fruit averaged 64 per cent. above two and one-half inches in size. The trees which had been thinned to 100 leaves per apple in 1933, showed about eight per cent. bloom with approximately an 80 per cent. set, yielding slightly over four bushels per tree. During 1934, with a light bloom and set, thinning consisted of breaking clusters on the trees which had been thinned during 1933.

During 1933 the check trees again bloomed heavily, showing about 75 per cent. bloom and 80 per cent. set. The yield was approximately 12 bushels with an average of about 50 per cent. of fruit under two inches in diameter. The trees thinned to 50 leaves per apple during 1933 and 1934 showed an average of 45 per cent. bloom and 90 per cent. set. The yield, after moderate thinning, was four and one-half bushels, of which 65 per cent. of the fruit was above two and one-half inches in size. The trees which had been thinned to 100 leaves per apple during 1933 and 1934 showed a bloom of 25 per cent. and a set of about 66 per cent. The yield was over four bushels, of which 75 per cent. was above two and one-half inches in size.

It should be stated that a second group of Transparent trees were thinned to 50 and 100 leaves per apple 25 days after full bloom in 1933. The trees did not give a crop the following year, but such thinning did result in much larger fruit than that from unthinned trees.

Jonathan—Little actual data can be given at this time on the effect of thinning on annual bearing of the Jonathan variety. In 1932, several trees were thinned to 50 and 100 leaves per apple 45 days after full bloom. Such thinning reduced the total fruit crop, but did result in large, very well colored fruits. The unthinned trees showed only 28 per cent. of fruit having above 75 per cent. color, while the thinned trees showed from 68 to 79 per cent. fruits having above 75 per cent. color. These trees showed little or no bloom in 1933. Similar results on size and color of fruit were obtained from a large block of Jonathan trees in 1935.

Delicious.—The work with this variety has been in progress only one year, and it may be said that, during 1935, thinning to 50 or 100 leaves per apple 20, 30, 45, or 60 days after full bloom has resulted in a considerable reduction in yield, but an increase in larger-sized fruit and a very definite increase in percentage and intensity of color. The fruit from the earlier-thinned trees did not seem to show any appreciable differences in size and color than those from the later-thinned trees.

Stayman Winesap.—During 1935, trees of this variety were thinned to 50 and 100 leaves per apple at intervals of 15, 30, 45, and 60 days after full bloom. In color and size of fruit the thinned trees were far in advance of the unthinned trees. The percentage of fruits in the larger-size groups (above 3 inches) was from 2 to 3 times greater on the thinned trees. The time of thinning apparently had little effect on the size or color of the fruits. The yield of fruit was rather appreciably reduced where thinning to 100 leaves per apple was practiced. This reduction, however, was not so noticeable on the crop from the trees which had been thinned to 50 leaves per apple.

York Imperial.—The commercial importance of this variety in the Shenandoah-Cumberland section made detailed study of the variety imperative. In 1932 a block of 80 trees was laid out. One-half of the trees have received 10 pounds of nitrate of soda in the early spring and the remainder received no nitrate. A group of trees in each of the lots was thinned to 50 and 100 leaves per apple 30, 45, and 60 days after full bloom. Detailed records have been kept for the past four years on bloom, set, and yield of fruit from these trees.

The crop during 1932 was very heavy, and it was observed that those trees which had been nitrated and thinned had better color than the nitrated, but not thinned. A like difference was noted between the non-nitrated trees. The size of fruit was increased in both plots by the thinning.

In 1933 it was observed that those trees which were thinned to 50 leaves per apple in 1932, 30 days after bloom, had a fair crop of blossoms. Those trees thinned to 100 leaves per apple in 1932, 45 days after bloom, likewise showed a fair bloom. Due to a light set, all fruits were large-sized and well colored. The check trees showed little or no bloom in 1933.

In 1934 there was a generally heavy bloom over the entire plot. Two additional thinnings were added during 1934. A group of trees was thinned to 50 leaves per apple 20 days after full bloom, and an additional group was thinned to 100 leaves per apple 30 days after full bloom Again actual color counts and sizing showed the fruit from the thinned trees to be much larger and better colored than that from the unthinned trees.

The blossom and set records taken in 1935 showed that thinning 30 days after full bloom to 100 leaves per apple had given a crop of blossoms the following year. Although the blossom and set were not heavy, some thinning was done, particularly in the tops of the trees.

Before a grower decides definitely upon a type of thinning to be used in his orchard there are several factors which must be taken into consideration. Should the market demand be for a large-sized apple of the variety, as in Yellow Transparent, thinning will undoubtedly be profitable.

On the other hand, should small fruit be desired as for the export market, thinning may not be profitable. It is apparent from the data given here that increasing leaf area per fruit has resulted in larger size and, in the case of red varieties, better color in the fruit harvested.

The condition of the tree foliage is another important factor to be taken into consideration. A large-leaved variety such as the Oldenburg or Yellow Transparent will naturally be able to carry to full development a larger crop of fruit based on tree capacity than a variety with smaller leaves. In other words, the increasing of leaf area per fruit on a small-leaved variety or a tree in low vigor will necessitate the removal of more fruits than would be required for getting the same leaf area on a large-leaved variety or a vigorous tree.

In the thinning discussed in this paper, establishing a foliage area per fruit has been based largely on spur counts. Examination of foliage indicated that a fairly vigorous and strong spur would usually carry 3 or 4 fairly large leaves and a similar number of small leaves. In thinning, such spurs were considered to have five good leaves of average area. Thus in thinning to about 50 leaves per fruit, one fruit was left to each 10 spurs. In a like manner, if 100 leaves per apple were desired, 20 spurs were left to carry or feed one fruit. By such estimating it is possible to determine rather quickly about how much spacing of the fruit of any variety will be necessary to give the desired leaf-fruit ratio.

Should a grower desire to secure annual bearing within a variety, thinning must be practiced early. Generally it has been noted that thinning to 100 leaves per apple has resulted in successive crops of fruit on the Yellow Transparent and York Imperial varieties when such thinning was practiced not later than 30 days after full bloom.

Further factors to be considered are the cost of the thinning and the availability of labor. It should be stated that early, heavy thinning is likely to be very costly due to the fact that so many small fruits must be removed. If thinning is practiced after the "June-drop" many small fruits will have fallen. It is doubtful, however, if such thinning will aid toward securing regular crops. Late thinning, however, will result in increased size and color of fruit.

Thinning in itself, of course, is not alone sufficient to insure a good crop of fruit. It is simply another orchard operation which allows an orchardist to aid his trees in the production of high quality fruit.

It should be borne in mind that the type of thinning which was used in the above experiments was used to attempt correction of the biennial-bearing habit. Less severe thinning would be recommended for a grower who desires only to improve the size and color of the immediate crop on the trees.

COVER CROPS FOR THE PEACH ORCHARD: THEIR HANDLING AND EFFECT ON THE TREES AND FRUIT

By F. P. CULLINAN

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The use of cover crops in the peach orchard has been a recommended practice for a great many years. On the basis of years of experience, peach growers the country over have adopted a method of clean cultivation, with or without cover crop. Unlike apple orchards, not many commercial peach orchards are found growing in sod. Keeping bearing peach trees in vigorous growth requires careful attention to pruning, fertilizers, and soil management. At best, peach trees are short-lived compared to the apple, and vigor seems to be most easily maintained under some system of tillage with cover crops. In some regions growers have made it a definite practice to use at least one cover crop annually, usually seeding it some time after the fruit has been harvested, allowing it to grow during the balance of the season, and turning it under early the following spring.

While cover-cropping has been a recommended practice, it has by no means been universal. In some regions peach orchards have been allowed to go through the winter without a cover crop growing on the soil between the trees. This has frequently resulted in serious loss of top soil and plant nutrients due to erosion and leaching.

It may be well to first consider some of the advantages of using cover crops in the orchard. Winter injury to the peach has always been one of the hazards of peach growing. In regions where there is abundant autumn rainfall, crops which will grow rapidly in the fall may assist materially in reducing the water supply to the tree. With young trees on soil high in nitrogen growth may continue late in the season, and cover crops will help to check terminal growth. There are, of course, some regions of the country where fall rains are not abundant, the soil freezes deep in winter, and the drying out of the soil is not desirable. However, in the eastern part of the country, particularly in this region, this is seldom the case.

Peach trees require a considerable quantity of nitrogen for best growth and development. Cover crops are a valuable adjunct in maintaining the nitrogen supply in the soil. If the plants used are leguminous, they should also increase the nitrogen content. Mineral nutrients, including nitrates, which might leach out of the soil or be washed away in surface run-off, are taken up by the cover crop and returned to the soil when the cover is turned under. When these plants decay there is an additional beneficial effect from the increase in humus or organic matter content. The addition of this organic matter serves another very impor-

tant purpose in that it affects the physical condition of the soil. It is an established fact that frequent cultivation destroys the organic matter content. If this organic matter is not renewed or maintained, the fertility and physical condition of the soil will be seriously affected. With improvement in the physical condition by incorporating large amounts of plant residue in the surface soil, conditions are made favorable for better water penetration. This is of particular importance during a growing season of light rainfall, when it is desirable to retain a maximum amount of the water that comes in showers.

Since most of our peach orchards in the Cumberland-Shenandoah Valley are planted on sites which are relatively high in elevation with reference to the land adjacent to the orchard, so as to ensure good air drainage, there is always the danger of rapid run-off of surface water with its consequent disastrous accompaniment of erosion. This, then, raises a very practical question of how the soil in peach orchards on such locations can be handled by cultivation in order to conserve the moisture supplied by summer rains, and at the same time prevent erosion. Here cover crops have a very important place in the soil management program of the peach orchard.

In growing a cover crop in the peach orchard we are essentially growing two crops on the same soil, the peach and the cover crop. If these can be grown together so as to be mutually helpful, that should be a satisfactory program. On the other hand, if one competes with the other, the results obtained may not be so satisfactory. Since we are interested primarily in growing peach trees for the fruit produced, we are more interested in the growth and behavior of the tree than we are in the cover crop.

Let us see in what ways the cover crop may compete with the peach tree. We know that the tree will not make satisfactory growth without an adequate supply of moisture and mineral nutrients. Cover crops have the same requirements. We also know that it is very important that trees have an adequate supply of moisture during the period of most rapid growth of the fruit, which is frequently spoken of as the period of final swell, and which occurs with most varieties during the three or four weeks before harvest. During this period the peach fruit increases markedly in volume, and without an adequate moisture supply, maximum size will not be obtained. It is very important, therefore, to know how a growing cover crop will affect the growth rate of the fruit. In the regions where irrigation can be practiced this is not an important problem. In the humid regions of the East, where we must depend upon the moisture stored in the soil from the winter and spring rains, the moisture factor is an important problem. In some years the rainfall during the period of maximum fruit development is inadequate for the peach tree alone. A growing cover crop may reduce the moisture supply in the soil to a

critical point much sooner than the tree alone could exhaust the available supply.

In recent years many peach growers have raised the question as to the desirability of frequent cultivation in the peach orchard. I think it can be stated as a fact that the intensive cultivation of peach orchards during the summer, a practice that was followed some ten years ago, has been considerably modified. Summer cultivation to keep down weeds has in many instances been the only stirring of the soil that has been given. Along with this reduced summer cultivation has arisen the question of the desirability of reducing cultivation still further and growing a cover crop during the greater portion of the growing season. This is a subject on which we have little information.

Four years ago we started some investigations at our Horticultural Field Station, Beltsville, Maryland, to obtain additional information on the effects of cover crops, when seeded early, on tree growth and fruitfulness. We have had two important viewpoints in mind: (1) Starting with a new peach site, can we appreciably build up the organic matter content by summer and winter cover crops while the trees are young and before the covers will seriously compete with the trees for moisture? and (2) assuming the trees may be slightly affected in growth during the first years by moisture and nutrients utilized by the cover crop, will the added humus, from the standpoint of increased fertility, or perhaps slightly increased water holding capacity, be a compensating benefit?

Two blocks of trees are used in this experiment; one, an Elberta planting on a gravelly loam soil with a gravelly clay subsoil, and the other a Belle block on a sandy loam soil with a clay subsoil predominating. The former has an available water supply of about 12 per cent., and the latter, about 8 per cent. above the wilting percentage for these soils. The cover crops selected for use are sweet clover, Korean lespedeza, soybean, buckwheat and crotalaria. Sweet clover and lespedeza are maintained as single covers, occupying the ground for the year. Sweet clover thus far is treated as a biennial, disking it down after it has gone to seed. The lespedeza is allowed to reseed itself; the dry hay is disked under in late March, and no further treatment is given to the plot until the following spring. Where weeds appear in the clover and lespedeza plots, they are clipped just above these covers. The soybean, buckwheat and crotalaria are summer covers, followed by a winter crop of rye and vetch. In addition, plots are maintained with summer cultivation, followed by a winter cover only of rye and vetch, and others in which manure is added to the rye and vetch at the rate of 8-10 tons per acre. The winter cover is seeded about September 1 and turned under about April 25-May 1, when the rye is about knee high and some of the heads are showing. The summer crops are seeded about June 1.

The trees are now four years old, having received uniform treatment

of soybeans, followed by rye and vetch during the first year, and differential cover crop treatment for the last three years. The soil adjacent to the trees in all cover crop plots has been cultivated, and this area has been increased each year by reducing the width of the cover crop strip sown. The trees received liberal applications of nitrogen, starting with one-half pound per tree during the first year, and increasing this amount to a pound in the second year, two in the third, and three in the fourth. The cover crops, with the exception of lespedeza and sweet clover, have received a 200-pound application of 5-8-5 fertilizer drilled in when the seed was sown. Careful records have been taken on the growth of the trees each year, and soil moisture determinations under the cover crop have been made once a week during the periods of moisture stress.

The results to date indicate that for the three-year period the best growth of tree has been established under the single winter cover crop of rye and vetch, with light summer cultivation to keep down weeds. Growth has been best where manure has been added to this combination. Closely following the winter rye and vetch is the soybean-summer and winter rye-vetch combinations. The rank of the various plots, based on the annual circumference increase in trunk for the three-year period 1932-1935, is,

1. Cultivation summer; rye, vetch and manure, winter.
2. Cultivation summer; rye and vetch, winter.
3. Soybeans summer; rye and vetch, winter.
4. Buckwheat summer; rye and vetch, winter.
5. Lespedeza.
6. Sweet clover.

The explanation for the better showing of trees in the summer cultivated and summer cover plots as contrasted with the sweet clover and lespedeza sods is suggested in the marked reduction in moisture under the latter. In two of the three years there were long periods when the moisture in the soil supporting the cover crops was reduced to the wilting percentage. In 1934, a year of severe drought, the moisture under lespedeza and sweet clover was reduced to the wilting percentage in the first two feet of soil from the period of July 5 to August 9. During this same period the moisture in adjacent soil not under a cover crop was from 4-5.5 per cent. above the wilting percentage. Buckwheat and a light cover of crotalaria were above the wilting percentage, although soybeans did reach the wilting percentage for a two weeks period.

That such a shallow-rooted plant as lespedeza would reduce the moisture in the surface two feet so early was surprising. It should be pointed out, however, that there was a very dense stand of plants on both the lespedeza and sweet clover plots. These covers reduced the moisture early in the season when moisture was being stored in summer cover crop plots, where the cover had not yet been seeded.

In addition to moisture shortage, there is a possibility that there was not a readily available supply of nutrients to trees in sweet clover and lespedeza at all times. The trees may have been deprived of more nitrogen in the early part of the season by the actively growing lespedeza and sweet clover at the time rye and vetch (which might also have competed with the trees for nutrients) had been turned under on the other plots. A complete fertilizer had not been applied to the lespedeza or sweet clover plots after the first year. The amount of nitrogen applied to each tree should have been adequate, in view of the fact that the tree rows were cultivated. In the annual and biennial legume plots, however, there are always more plants close to the tree than on the plots more frequently disked. Again, the breaking down of the dry lespedeza and sweet clover stems may have reduced the nitrogen supply available for tree growth. From a practical standpoint, in somewhat shallow soils, it is doubtful whether sweet clover can be successfully handled as a biennial, as it was handled thus far in these experiments. More clipping in the first and second years, and possibly disking in a dry season, would be required. Experimental evidence obtained by agronomists indicates that large amounts of nitrogen are returned to the soil when the sweet clover is turned under early in the second year, while the growth is still succulent. Starting with a new site in which the soil is not very fertile it would be desirable to keep the sweet clover at least three feet from the trees, in order to conserve moisture and nutrients for the trees.

Lespedeza is a plant that is easily established in many soils in this region. With us it has been quite drought-resistant, shedding its leaves when the soil becomes very dry but remaining alive until it is revived by late summer rains. This cover crop can be grown cheaply, and it has a place as a cover crop in the peach orchard if properly handled. On hilly sites and steep slopes it may be used in alternate rows with an annual such as soybeans or buckwheat. It will thus serve a very important purpose in reducing erosion which frequently occurs when such slopes are tilled.

Under our conditions, the combination of soybeans as a summer cover followed by winter rye and vetch has proved very satisfactory. While tree growth has not been so good as with the single winter cover plus manure, it has been the best when all summer cover treatments are considered. In most peach regions the cost of manure is prohibitive, and one must rely on the satisfactory cover crops which can be most cheaply grown. The yield of rye and vetch in green manure following soybeans has always been good. In recent years soybean seed has been relatively cheap. Good inoculation is essential in getting the best returns from the money invested in seed.

Under some conditions buckwheat may prove quite satisfactory in yield of green matter. Usually sufficient seed will be formed before the crop is

turned under in late summer to give a second stand before the fall cover is seeded. Some plants will grow in the rye and be killed down with the first frost. The plants are not deep rooted and will wilt down when lack of moisture becomes acute in the top six inches of soil. One objection to this crop is that the plants are easily killed by the weight of tractors and sprayers.

In the three years during which these experiments have been under way there have been marked benefits from the use of cover crops. Perhaps the most important benefit has been in increasing the fertility of the soil. A single winter cover of rye and vetch has helped to maintain fertility on the summer cultivated plots. The tonnage of rye and vetch produced has been greatly increased when this crop followed a legume such as soybeans. Another important benefit, possibly of equal importance from the standpoint of the tree, has been the effect on the physical condition of the soil. A surface soil which has had a tendency to bake following the packing effect of spring rains and drying winds has been rendered less compact and more permeable to rainfall through the turning under of cover crops. Surface soil erosion has been reduced. This has been observed on the plots in the gravelly loam as well as on the clay loam where there is sufficient slope to permit rapid run-off. Finally cover crops have increased the organic matter content of the soil. While the amount has been slight, the increase has been significant with those covers which returned the greatest amount of dry matter to the soil.

RELATION OF SOIL MOISTURE TO CRACKING AND RELATED TROUBLES OF APPLES

By J. R. MAGNESS

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The subject which has been assigned to me affords a good deal of latitude for discussion. While we can not say definitely that these other troubles of apples we plan to discuss are closely related to fruit cracking, we believe it is worthwhile to discuss briefly several of the so-called physiological disorders that afflict apples and to review briefly our rather meager knowledge concerning them.

There are four common disorders of apples which can be included in this category. They are as follows:

1. *Fruit cracking*, characterized by an actual splitting of the skin of the fruit, may occur at any time during the growing season but is much more likely to occur during the last month prior to harvest. Fruit cracking will be discussed in detail later.

2. *Bitter pit, Stippen, Baldwin spot or York spot* are different names for the same disorder. It consists of brown areas of dead cells distributed through the flesh, mainly in the blossom half of the fruit. Many of these areas may be directly under the skin, but in true bitter pit they are also found down in the flesh. Usually the vascular bundles in such fruit will be somewhat discolored. Frequently the spots have a bitter taste if chewed, hence the name "bitter pit." This trouble is likely to be confused with a similar pitting caused by the rosy apple aphid. Aphid injury, however, is limited to the area directly beneath the skin whereas true bitter pit occurs down in the flesh as well. Bitter pit develops toward the close of the growing season and after the fruit is harvested. It is particularly likely to occur in storage in fruit harvested in an immature condition. Large-sized overgrown apples are much more subject to the trouble than are smaller medium-sized fruit, hence it is particularly prevalent on trees carrying a light crop of fruit and on trees that are very heavily thinned, heavily fertilized, heavily pruned, or heavily irrigated. In experiments in the Pacific Northwest, heavy irrigation prior to harvest tended to increase the amount of bitter pit. The exact cause of bitter pit, however, is not known. It is found throughout the world wherever apples are grown and occurs occasionally on practically all varieties although certain varieties are much more subject to bitter pit than others. Among commercial varieties in the United States, Baldwin, Gravenstein, and York Imperial are particularly subject to bitter pit.

3. *Drought spot, cork,* or corky core is characterized by large brown corky areas in the flesh of the fruit. These areas are usually about the core although late in the season they may also develop under the skin of the fruit. Some investigators have distinguished between the trouble as it occurs at the core and that near the surface. Both, however, appear to be associated with insufficient moisture at some time during the growing season, hence the name "drought spot." While the skin of the fruit is not discolored from deep drought spot, the surface tends to be irregular and pebbly or roughened. Using this as an index, it is possible to sort out a good deal of the drought spot fruit at harvest time.

Recent investigations in New Zealand and in British Columbia indicate that drought spot may be associated with a deficiency of boron. At both of these points, injections of boric acid into the trunks of trees have largely prevented the trouble. These investigations have been carried on only during the past year, and these results have not been checked at any point in the United States. It is planned to conduct work along this line next season. If this trouble is due to a deficiency in boron or some other minor element required for plant growth there would appear to be at least the possibility that bitter pit is caused by some similar deficiency. The fact that this trouble has long been associated with drought conditions does not preclude the possibility of its being due to a nutritional deficiency, as the effects of such deficiencies are accentuated

under drought conditions. Also, it has long been known that drought spot could not be completely corrected by furnishing ample soil moisture. Therefore the work in New Zealand and British Columbia offers a valuable suggestion as to the possible cause and cure of this trouble.

4. *Water core.* The fourth physiological disorder along this line is water core. In affected fruit, the spaces between the cells become filled with liquid consisting of water with some dissolved substances. This results in the tissues taking on a glassy or watery appearance rather than the white of normal apple flesh. Water core is most serious in sections having high growing-season temperatures and particularly in varieties that tend to ripen while temperatures are high. It is not associated with surplus water, as many growers believe. In fact, fruit suffering for moisture is much more likely to become affected with water core than fruit on trees well supplied with moisture. Water core is apparently due in part to high temperature injury. It develops first in fruit on the south and west sides of the trees and well exposed to the sun. Highly-colored and mature fruit is particularly subject to water core. The development of water core in many varieties is an indication that the fruit is in proper condition for picking. Particularly susceptible varieties should be watched closely and should be harvested when water core tends to become excessive. Apparently small water-core areas tend to clear up in storage and the quality of the fruit is not seriously impaired. On the other hand, when a large area of the flesh becomes water-cored, the condition does not clear up in storage and the quality of the fruit is very poor. So far as relationship to water supply is concerned, water core is reduced by sufficient moisture as contrasted to drought conditions.

Factors Affecting Fruit Cracking

Among the varieties grown commercially in Maryland, Stayman Winesap and Wealthy are the most subject to cracking. Under extreme conditions most of the crop of these varieties may be lost. A season rarely passes when the loss from cracking of these varieties is not five per cent. or more. Unquestionably cracking, particularly in the case of Stayman Winesap, constitutes the greatest source of cull fruit in this variety during most seasons.

Careful investigations conducted by Dr. Leif Verner at the Kearneysville, West Virginia Station have thrown considerable light on the factors which influence cracking in Stayman Winesap apples. His investigations have indicated that cracking could not be induced by supplying water to the soil as long as the air remained dry. Careful records as to when cracking occurred in the orchard indicated that all orchard cracking during the year of his investigations occurred in connection with periods of six or more hours of continuous saturation of the atmosphere. He concluded that atmospheric saturation was essential to fruit-cracking under the conditions of his tests.

These results are borne out by the experience with Stayman Winesap apples in the Pacific Northwest. Under irrigated conditions there, but with dry atmosphere and practically no rainfall during the growing season, cracking of Stayman Winesaps is of no commercial consequence. The only time that Stayman Winesap cracking ever occurs in that section, so far as the writer is aware, is when a rain occurs prior to harvest. There is no danger of cracking of fruit from applications of irrigation water to the soil.

One additional condition seems to favor Stayman Winesap cracking. If the soil is very dry before a rainfall period, cracking is apparently greatly accentuated. In the Middle West in 1934, orchards suffered very severly from lack of moisture during July and August, followed in early September by rains of considerable duration. In many orchards practically every Stayman Winesap cracked, and some Jonathan orchards showed cracking in 40 to 50 per cent. of the fruit. These observations indicate that drought conditions preceding the rain are very conducive to increased cracking.

Conversely, if the soil is well supplied with moisture prior to the rainy periods, cracking is much less likely to be serious. From the standpoint of duration of rainfall, conditions in Maryland and neighboring States were very favorable for cracking during the past growing season. During the first week of September there was a period of from 48 to 96 hours in different regions of practically continuous rain. Fortunately the soil was well supplied with moisture before this rain occurred. Even under this unusually long rainfall period, cracking of Stayman Winesaps was not excessive, in many orchards. The loss being less than average. We believe this was due largely to the fact that the soil was well supplied with moisture prior to the prolonged rainfall period.

Why Does Cracking Occur?

We do not know all the physiological factors which are responsible for the cracking of certain apple varieties and which prevent the cracking in others. Under conditions of drought, the sugar content of the fruit tends to be high. With a high sugar content when moisture is again available, the water tends to move into the cells holding sugar. In the case of the apple, water which entered the tree through the roots may move in through the stem of the fruit, also, a certain amount of water will enter the fruit directly through the skin. It is possible that these varieties subject to cracking have a skin more permable to water intake than other varieties, although this has not been definitely determined. In experiments on Stayman Winesap, Verner found that considerable quantities of water would go into the fruit through the skin and that in general those individual apples which absorbed water through the skin most readily also tended to crack most readily. More experimental work is needed on this, however.

It is also a well known fact that fruit which has become russeted due to spray injury or frost injury, or which has sunburned, is particularly subject to cracking. In an orchard near Philadelphia this year where experimental spraying was being done, one spray treatment markedly reduced the amount of russeting on Stayman Winesaps. While there was little cracking of Stayman Winesaps in this orchard, the plot carrying the most russet showed almost double the cracking which occurred in the plot with the least russet.

In conclusion we may ask the question, "What can we do to reduce cracking on Stayman Winesap and Wealthy?" Any treatment which tends to maintain a better moisture supply in the soil will, we believe, tend to reduce the amount of cracking that occurs. Mulching under some conditions has tended to reduce cracking of Stayman Winesaps, we believe, through maintaining somewhat better moisture conditions through the growing season. While we have not had Stayman Winesaps in our irrigation plots in Maryland, we believe irrigation would tend to reduce cracking under eastern conditions. Similarly, moderate summer cultivation rather than the growing of crops in the orchard during the summer months that will compete heavily for water, should be helpful. The maintaining of the trees in good vigor through the use of nitrogen and other soil management and pruning practices should be helpful through giving partial shade to the fruit and reducing sunburn. Fruit on trees in good vigor apparently tends to crack somewhat less than that on weak trees. Notwithstanding all these treatments, however, if the orchard is very dry and a prolonged period of rainfall follows, serious loss from cracking will unquestionably occur in these very susceptible varieties.

PRUNING PEACH TREES TO CORRECT THE ERRORS OF FAULTY PRUNING

By A. LEE SCHRADER

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Talks on peach pruning in previous years have usually dealt with a comparison of correct pruning with incorrect pruning. Results in terms of yield, growth, tree size, color of fruit, etc., have been presented to show that incorrect pruning has given markedly poorer responses in the above terms than a correct pruning. There is no question that some very serious ill-effects in growth and yield may occur and can be demonstrated easily by means of faulty pruning. However, the more difficult problem is to unscramble the effects of a bad job of pruning and make the peach tree grow and fruit in the desired fashion. The purpose of this article is to present methods of pruning to reform the tree that has misbehaved as a result of wrong pruning by its owner.

Pruning of a peach tree is an accepted practice, so no attempt will be made to give the advantages of pruning. Perhaps every peach grower has noted that during the life of a peach tree each succeeding year seems to present a new problem in pruning. However, for convenience let us divide the life of the peach tree into three periods, as far as pruning and its abuses are concerned:

First, the young tree. The aim in pruning a young tree is to develop a strong framework of well spaced branches. A light pruning rather than a severe cutting is advocated to favor the development of a large tree and early bearing. It is during this period that much incorrect pruning is done, especially in cutting too heavily as well as in making the wrong type of cut.

Second, the bearing tree. Heavier pruning becomes necessary after the tree comes into full bearing. This heavier pruning is essential to maintain desirable growth responses for production of annual crops as well as to limit the height of the tree and regulate the fruiting area to fit the soil conditions. However, mistakes in such pruning often occur, particularly in regard to the type of cuts made. The wrong type of cutting may result in a dense top and poorly colored fruit, to say nothing of the reduction in yielding capacity.

Third, the old bearing tree. These trees include only those which have become weak in growth due to heavy cropping for many years and lack of annual renewal pruning. Sometimes the trees have reached an age which prevents the tree from making the same strong growth that it did in earlier years. The use of a severe rejuvenation pruning is the only recourse for the fruit grower if he wishes to retain the trees. Such a pruning has often been too severe and a relatively slow rebuilding of a tree results. (See Maryland Bulletin 327.)

Two features of peach pruning may be listed as giving the most trouble as far as undesirable responses are concerned.

1. *Amount of pruning.* If too much wood is removed, the growth responses may be undesirable and the fruiting capacity of the tree decreased. Most growers recognize the bad results of excessive pruning of the bearing tree, but fail to see the effects with the young tree.

2. *Type of pruning cuts.* The types of cuts include "thinning out" which means the entire removal of a branch, and "cutting back" which means cutting back to a lateral branch in two years wood or older. The cutting of one year wood is usually termed "heading back"; although, some confusion exists as to the difference between the terms "heading back" and "cutting back" in discussing these pruning cuts. Most of the mistakes in pruning the bearing tree lie in the inability of the grower to make the proper pruning cuts to avoid undesirable growth responses.

With this introduction to the problems of pruning during the life of the peach tree, let us consider in detail the mistakes of pruning during the first period of the tree's life and how to correct such mistakes. The usual error in pruning the young tree is excessive heading of one year wood with the result of a dense growth of top, consisting of upright shoots closely spaced together often reaching a length of four or five feet for a single shoot in one season. This type of growth makes it difficult to form a well-spaced scaffold and the tall upright shoots invite further heavy heading at the next pruning which makes the situation worse in following seasons. Fruit buds are not formed under the dense foliage, whereas the young tree usually bears the first crop on the inside shoots. In spite of the great length of growth, the tree actually is kept smaller by such heavier heading; thus the bearing capacity is not developed early in the life of the orchard. (See Maryland Bulletin 299).

Another error which is made in pruning the young peach tree is in the excessive thinning or removal of shoots on the inside of the tree. These shoots should be saved to bear the first crops in the third or fourth seasons.

In considering corrective measures for young trees which by excessive heading have given the dense growth responses indicated above, it is found that thinning out the branches is the first step. In the next step, the most important corrective feature is to remove only the tips of the long upright shoots which are left after thinning, cutting only eight to twelve inches from the end of such shoots. Some lateral growths now may be thinned from this one year wood. These limbs may seem too tall and appear to be in a position to continue the height of the tree but in reality such limbs will bend over with the weight of fruit and the tree will become spreading in habit. One or two years of heavy fruiting will bring the upright limbs down in a spreading position and are then in a position to be cut back, if necessary. It is possible by these corrective measures to make the young tree respond in a most desirable way after one year following such corrective pruning. In other words, if properly done, one year of corrective pruning will undo much of the bad effects of previous pruning of a young tree.

In considering some of the errors in pruning bearing trees, we might list two common errors in type of cutting; the first error is in cutting back to small laterals and in heading back one year wood, usually accomplished by a heavy shearing cross the top of the tree. The result is a very dense top, a reduction in good fruiting wood in the top and poor color of fruit under the foliage. With such a growth response, the heavy shearing appears necessary to the grower at each succeeding pruning, but the problem is not solved in this way.

In the corrective measures to change such responses of the bearing tree it takes a couple of years of corrective pruning to eliminate the undesirable type of growth on such trees. One type of cut which must be

made consists of cutting back to a good lateral, that is a lateral which has relatively good diameter compared with the branch from which it arises. In addition a moderate thinning out also is necessary but most of the pruning will be "cutting back" to good laterals. *Cuts must be made in two year wood or older. Heading back of the one year wood must be avoided.* The upright one year growths must be removed if they are not of a willowy nature but many of the upright growths should be retained in the first season without heading back. If such upright growths bend to a spreading position, they may be kept in future seasons. Do not head back vigorous one-year wood in an attempt to lower the height of the tree.

A second error in pruning bearing trees which is not as evident as the first error is excessive thinning with little or no cutting back. The result is a very leggy tree with poor terminal growth. In spite of the large amount of wood removed by each thinning, the growth response is not appreciable. Seven years of such pruning on bearing Brackett trees showed a reduction in terminal growth of fifteen inches to three inches, compared with trees annually cut back with thinning. The corrective measures for the tree which has received excessive thinning include cutting back and no thinning until the desirable growth responses is obtained. From that point, a combination of cutting back and thinning should be maintained usually with more cutting back than thinning out. Too often the peach pruner thins out branches in greater proportion than he cuts back the branches to good laterals. A good plan to follow is to do cutting back as the first step in any pruning of a bearing tree and such cutting back will amount to a certain degree of thinning. The second step then would be the thinning out of branches which are crowding.

The errors in rejuvenation pruning of old trees are given in detail in Maryland Bulletin 327 so will not be repeated here. However, some growers have used this rejuvenation pruning on bearing trees which have not reached the stage requiring such pruning. If a bearing peach tree has received the proper amount of annual cutting back, it probably will not be necessary to resort to a rejuvenation pruning during the life of the tree.

Conclusions

1. It is important to interpret growth responses of peach trees to govern the type of pruning.

2. The corrective cuts in pruning of peach trees which have undesirable growth and fruit responses constitute in general:

   a. Light heading of one year wood in young trees.

   b. No heading of one year wood in bearing trees except water-sprouts in the lower part of the tree.

   c. Cutting back to good laterals instead of stubbing to small laterals.

d. Avoid heavy thinning or use no thinning if heavy thinning has been practiced in previous years.

e. Balance cutting back and amount of thinning on bearing trees according to the growth responses.

(Sixty lantern slides were presented to illustrate this article. Experimental work in several sections of the state have been shown progress on which this discussion is based.)

A. F. Vierheller, Extension Horticulturist assisted in the pruning work discussed in this paper.

ELIMINATING SOIL EROSION IN THE ORCHARD

By J. T. BREGGER

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If I were to ask the question as to what constitutes a successful formula by which the fruit grower can make money, you would probably answer to the effect that it would require the growing of a lot of fruit and selling it at a good price. In other words, successful production and successful marketing denotes successful fruit growing. On the other hand, if I asked you for the two main essentials of successful production, I would probably get a great variety of answers.

I like to think that there are two main factors in successful production, one relating to the tree itself and the other to the environment of the tree. I would want to find two things chiefly—a good healthy *leaf surface, which,* with the help of sunshine and other climatic factors, would supply the trees with food; and a *fertile soil* which would supply the trees with water and mineral nutrients. Without these two essentials, both very fundamental, practically all of our orchard practices and expenditures of funds would be largely wasted.

We should and must be interested in the soil because without it there is no need of the rainfall, nothing on which to apply our fertilizer, and nothing in which the fruit trees can grow. It is extremely significant, therefore, that we give important consideration to the subject of *soil conservation.*

Until quite recently, we have worried little about erosion in the United States, largely because we have thought in terms of geologic erosion.

Geologic erosion has made much of the soil which man-made or accelerated erosion is now destroying. We find it almost beyond our ability to understand why erosion was permitted to take place for so many years. However, there is nothing to be gained by regretting that the job of soil conservation was not attempted sooner.

The Seriousness of Erosion

Since America has cut down her forests and plowed up the prairie grass lands, approximately fifty million acres of fertile land have been ruined by erosion. Another one hundred twenty-five million acres or a third of the total land under cultivation has lost between 50 to 100 per cent. of its surface soil through sheet erosion, with an additional one hundred million acres showing some erosion.

It is not so much a decreased agricultural acreage which is facing us, but the fact that we are losing some of our best and most fertile land. This is particularly true from the standpoint of the fruit grower, as often the best fruit land is located on slopes subject to severe erosion when not handled in the right way. If the eastern part of the United States is to survive in fruit growing, it must conserve its soil. Pacific Coast fruit growers, who can substitute irrigation for rainfall, are conserving their orchard soils much better than fruit growers in the East.

Erosion Is a Public as Well as a Private Problem

The rapid silting of large and small rivers has become more and more of a public expense. Reservoirs built for a long period have filled so rapidly that they no longer hold the quantity of water for which they were built. This has not only affected irrigation projects in the West but city and community water supplies throughout the land. Not only then must we consider the financial loss resulting from the soil losses to our farms, but also the additional expenditure needed to remove this soil from certain locations where it has lodged.

The nation which will endure the longest is the one which will conserve its valuable resources, one of the *greatest* of which is its soil. To the nation as well as to the individual farm owner, farm land has a so-called "par value," based on the quality and quantity of its soil. When, through erosion, part of this soil actually leaves the farm, this par value must necessarily decrease. Not alone do we have the land value or *principal* decreasing, but also the income or *interest* which can be derived from it. Good soil is not only a farmer's wealth but his source of income, and when taken altogether, constitutes the basic agricultural wealth of the nation. The maintenance and increase of farm income is one of the chief goals of the farm owner. Soil erosion reduces the basic farm wealth and impairs the income from the land for years to come.

Types of Water Erosion

Gully erosion is probably the best known type, both to the layman and to the farmer. It is evident both in its existence and its damaging effects. By definition we ordinarly term gullies as those depressions left by soil washing which are too large to be filled up or erased by the ordinary types of farm machinery. These gullies or gutters, as they are

sometimes called, actually take land out of farm use, and unless controlled, will continue to increase in size from year to year.

Rill erosion is what might be termed a less severe type of gully erosion. Rills or small gullies are usually erased by ordinary cultivation methods. Though land is not completely ruined by this type of erosion, still the actual loss of fertile soil may in many cases be higher than in gulley erosion.

The third type called *sheet erosion* is perhaps the one to which we should pay the most attention because of its "elusive nature." While we ordinarily call any kind of man-made erosion a "soil thief," we can call sheet erosion a "sneak thief." Such erosion means the loss of the best top soil usually at a rate much faster than we would believe possible. When a new layer of subsoil is plowed up, it is made clear that an equivalent depth of top soil has been washed away. Naturally such additions of subsoil dilutes the fertility of the top soil, and little by little, unless fertilized very heavily, it becomes devoid of organic matter and plant food.

Rapidity of Erosion Under Various Types of Land Use

As previously mentioned, there was little serious erosion taking place in the United States prior to the cutting of forests and the plowing of vast grazing areas. The reason for this is that land does not erode rapidly under a permanent cover of these plants. While the least rapid erosion takes place under forest conditions, yet a fertile soil may be built up faster, under either forest or grass, than it erodes away. On the other hand and in contrast to a permanent land cover of forest trees or grass the average farm has a rotation of crops which lessens to a large extent the normal conservation of soil and fertility which exists under a permanent land cover. As a rotation includes a higher per cent. of cultivated crops, the erosion it causes increases until the point of maximum erosion under any given set of conditions is reached where continuous cultivation is practiced. Thus we have a strong basis for the observations so often made concerning the most serious type of erosion which occurs in the average peach orchard. In fact the entire layer of top soil may be eroded away during the mere lifetime of the orchard, averaging let us say between fifteen and twenty years.

Erosion on Orchard Lands

The rapidity of erosion in an orchard may be directly correlated with the type of soil management practices. In other words, we may have, and we do have, the two extremes of erosion severity under orchard conditions depending upon the slope, ground cover, and the frequency or duration of cultivation.

Under the old sod culture, common in apple orchards of certain eastern and western states, erosion has probably been little or no greater than

exists under other grass or pasture land. The orchards of the Pacific Northwest, for instance, under a more or less perennial alfalfa sod, do not have an erosion problem. Even when so-called grass or sod is broken up each year through spring cultivation but allowed to immediately grow up again, little loss of fertility or soil takes place.

On the other hand, we may have our most severe erosion under orchard conditions and this is usually the case with respect to peach orchards in most sections of the country. Not only do peach orchards present the worst soil erosion problem we may have in many districts, but the soil losses are equivalent to those on fallowed or continuously cultivated land.

Before discussing this all-important problem, it must first be acknowledged that ordinarily we cannot get away from the erosible type of land on which to grow our peach orchards. We must face the important consideration that peach trees require good soil and air drainage, such as our hilly and sloping lands usually afford. The solution of the erosion problem in orchards, therefore lies in the proper treatment of orchard land, rather than in choosing another type of location.

In California erosion has resulted in the ruin of orchard land valued from $300 to $1,000 per acre. While the value of the ordinary peach site in the East is not as great as that, still the destruction of such land by erosion demands immediate consideration.

In general there are two ways in which rainfall may be prevented from causing erosion. The first of these is to prevent accumulation of large quantities of water in one area, while the second is to slow up the speed with which the water runs over the surface of the soil. Both of these principles and the various methods of their accomplishment will be discussed somewhat in detail.

In the first place, the prevention of water accumulation is largely an engineering problem. While it may not always be possible to prevent water coming into an orchard from the land which lies above, still there are ways to take care of this water before it enters the orchard. A so-called diversion ditch is the best method of meeting the situation. This implies the drawing away of this water from the orchard at a low grade to a point where it may continue its way down the hill in protected water courses.

When it comes to handling the rainfall which falls on the orchard itself, we become concerned mostly with the necessity for slowing down its speed. This not only lessens its damage by erosion, but results in greater conservation of the water itself. Whenever accumulation does occur at any point, especially on a steep slope, diversion of this excess water becomes necessary. The speed with which water flows determines to a decided degree the soil carrying power. If we consult a very important formula in hydraulics, we find that the transporting power of water

varies as the fifth power of its velocity. In other words, water moving at the rate of two miles per hour will carry thirty-two times as much soil as it can carry at one mile per hour. How to slow up this speed of water once it reaches the surface of the soil is the all-important problem, and herein lie the practical methods of modern erosion control.

We can divide erosion control methods roughly into two divisions: (1) Mechanical Methods and (2) Vegetative Methods. Under mechanical methods, we may consider the use of (a) Diversion terraces, (b) Contour planting, and (c) Mulching.

Adaptation of Control Measures

A diversion terrace is a mechanical structure of soil which changes temporarily at least, the slope of the hill so that surface water will be stopped or slowed up on its downward journey. In general it may be stated that a great deal of the water which is slowed up will soak into the soil. Excess water, however, will be diverted at an easy grade around the terrace into an outlet where it can cause no further damage.

Terraces may have various grades with relation to the hill and with relation to their slope toward the outlet. Occasionally bench terraces are built without any grade whatever, but in such cases the land between them should be in sod or provided with sod strips for protection in case of heavy rains. An apple orchard having this type of terraces is to be found near Leesburg, Virginia.

Contour planting goes hand in hand with terracing, and may be done with very good success without it depending on the slope. In California, the general rule is to contour-plant orchards on slopes ranging from 4 to 14 per cent., using bench terraces with permanent vegetative risers on slopes above 14 per cent.

Where slopes are sufficiently steep to allow serious erosion, new orchards should be planted on the contour. They may also be terraced if the soil is of a satisfactory type and depth, the type of terrace recommended depending upon local conditions, land values, etc.

If the orchard is already planted and considerable erosion has taken place, there are two solutions possible: (1) Some of the lost soil may be hauled back into the orchard, such as is done occasionally in California; (2) Save the soil which is left through use of diversion ditches and a good cover-cropping system. Soil saving dams may also be built in any gullies which may already be formed.

Mulching is another form of mechanical protection from erosion. Green manures need not necessarily be grown in the orchard, as they can be grown outside and applied to the orchard soil. It is a very significant fact that plant materials *on* the soil are of much more value in resisting soil losses from erosion than plant materials *in* the soil. Mulching with

any kind of material such as trash or straw, which will slow up the flow of surface water, will be very valuable in erosion control.

Vegetative Control of Erosion

The principle involved here concerns the decreasing as far as possible of the speed with which water travels so as to reduce its eroding power to the minimum.

We have already discussed sod culture, but since its application is limited almost entirely to apple orchards, we should really discuss this problem from the standpoint of the peach orchard, where erosion is so severe. For some reason the idea is prevalent that peach orchards *must* be cultivated, frequently and continuously throughout the growing season of the tree and fruit. Already we can see a decided reaction from this over-cultivation which has resulted in such serious soil erosion.

The use of a cover crop to control erosion can be, and is, a very practical method. A cover crop must be used, however, which has a growth suitable to accomplish this purpose, and it must be planted at such a time that its presence will coincide with the seasons of greatest rainfall.

The average peach grower objects to an early summer seeding of cover crop for the reason that he thinks such crops tie up too much nitrogen and compete with the trees for moisture. Such arguments, however, may be met by advocating a slightly delayed planting of the cover crop following the early spring period when trees demand the most soil nitrogen. Then by mowing the cover crop during any dry summer period when there is not enough moisture for both trees and cover crop, the fruit trees will not be unduly affected by the cover crop. This clipping of the cover crop will also aid in erosion control, as well as in greater water absorption.

Cover crop management should take into consideration the growth periods of the peach. Several State experiment stations, including New Jersey, Illinois and California, have determined that the Elberta peach, for instance has its first period of enlargement during approximately fifty-five days following the blooming period. During the next thirty to thirty-five days very little growth or enlargement takes place. Then the second period of growth extends during the last forty to forty-five days prior to harvesting. It might be suggested, therefore, that the cultivation period of the peach orchard need ordinarily extend only to the approximate end of the first growth period. Even if the cover crop is planted ten days prior to the end of the first growth period, it will not have made any appreciable growth by that time. The only important competition it could have with the trees would be during the last period of fruit growth, at which time mowing of the cover crop could be resorted to in the case of dry weather. The deeper the soil, the greater advantage the trees have over the cover crop in competition for soil water.

Two cover-cropping systems are being recommended by horticulturists for use in peach orchards in the Cumberland-Shenandoah Valley. One of these involves the use of a single cover crop handled much as has just been indicated, plowing or disking under in the early spring. Such a cover crop may ordinarily consist of a seed mixture of one or two legumes and one or two non-legumes. For instance, in Pennsylvania a mixture of sweet clover with sudan grass or millet is recommended. Another good mixture consists of sweet clover and soybeans, perhaps including crimson clover. Buckwheat may be substituted for soybeans, but is not either a good soil building or an erosion controlling crop by itself.

Other horticulturists are advising a double cover crop program, consisting of two distinct cover crops per year. Under this system, rye and vetch are planted in August or September, to be plowed or disked under the following spring or without mowing. Usually this mixture is allowed to stand until it is 18 to 20 inches high, when it is disked in. This allows a considerable amount of plant material to remain on the surface, where it will do much to resist erosion during the brief cultivated period which usually exists up until some time in June, when a soybean or other summer cover crop is planted to grow until the rye and vetch is again planted.

In the southern districts, where Korean lespedeza grows well, this legume makes an ideal erosion-resisting cover crop. Such a plant is also very good for use on steep slopes as a more or less permanent cover for every second third or four row parallel to the contour of the hill. These so-called buffer strips may be moved each second year so as to provide an opportunity to increase the organic matter supply of the soil uniformly over the orchard and at the same time keep erosion under control.

Commercial peach growing in the East cannot continue if the present rate of soil losses through erosion continues to destroy our best peach sites. If fruit growers allow the top soil to be lost from every orchard they plant, there will soon be an end to good or new locations. This is a serious and timely matter and must be met not alone by future generations, but by us today.

An erosion control program based upon the foregoing principles and practices, and adapted to the individual orchard, not only will make possible profitable fruit crop production during the normal lifetime of the orchard, but will prolong the bearing life of such an orchard through the conservation of soil fertility. Moreover it will conserve the top soil necessary for the next field or orchard crop which may follow orchard removal.

Water conservation goes hand in hand with soil conservation. While water conservation is important and water losses often are appreciable, soil conservation remains the most important consideration. Soil once lost is lost forever!

ROOTING HABIT OF APPLE TREES ON DIFFERENT SOIL TYPES

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The nature of the soil is becoming increasingly important in fruit production. With changing economic conditions it has become apparent that orchards which in the past were able to return a profit are no longer able to do so. Cost of production has mounted while returns for the fruit have declined. There is little hope for higher prices, at least in the immediate future. The solution would seem to lie in lowering the cost of production by obtaining higher yields per acre. High yields are fundamentally dependent upon a favorable soil.

The soil has always been thought of as a factor to consider in locating an orchard. Text books on fruit growing have, as a matter of course, stressed that a good orchard soil should be deep, well drained, and retentive of moisture. The interpretation of these words is usually left to the imagination of the reader. The inference seemed to be that anyone after reading the definition should be able to choose a good soil on which to locate an orchard. Unfortunately the problem is not this simple.

Fertility is important in orchard soil, of course, but this can be supplied with relatively little expense. What is more important are the physical properties of the soil as they affect the depth and distribution of the roots. Little can be done to correct an inherently bad soil from the standpoint of rooting. Studies in New York have shown that orchards located on soils affording deep rooting are without exception higher yielders when receiving at least average commercial care. The tree is dependent upon the soil and the root system for its water supply. In this fruit region, the natural water supplying power of a soil is probably the most important factor in determining the adaptibility of a soil for orchard purposes. It naturally follows that a deep, well developed root system is essential if the tree is to receive an adequate supply of water.

Root System of Plants

Experiment Station workers and fruit growers know very little about the behavior of roots as compared with the knowledge they possess of the above ground parts of the tree. A knowledge of the nature of the root growth of plants is important, not only from the standpoint of moisture supply to the tree, but also in furnishing mineral nutrients for growth. Our present knowledge of roots is very incomplete because of the difficulty encountered in studying them.

Several facts that have been learned about roots and their behavior are

interesting. A knowledge of these facts should aid the fruit grower in his soil management and general cultural practices. Unfortunately most of the work has been done on annual crops rather than fruit trees.

Roots, like animals, take in oxygen and give off carbon dioxide; therefore, in order to function properly they need an adequate supply of air. Air is also needed in the soil for the micro organisms which are so important in making plant food available for the tree. About 50 per cent. of the volume occupied by the soil is pore space. Under best conditions for tree growth about half of this space is filled with water and one-half with air. In imperfectly drained or water-logged soil the air is partially or completely displaced by water and the roots either die or cease to function properly. A shallow root system results. In the fruit sections of New York the drainage of the soil is one of the most important factors in considering the adaptability of a soil for orchard purposes. In West Virginia, at least, and I think the same is true in Maryland, there are very few cases of poorly or imperfectly drained orchards. We have, however, shallow rooting due to other reasons, which we shall discuss.

We often hear varied opinions regarding the vertical and lateral extent of root systems. A squash plant growing in the greenhouse in Massachusetts was examined and the total length of the roots of this plant was estimated at 15 miles! It would be safe to assume that the total length of the root system of an apple tree would be at least several miles. Another instance is reported in Nebraska where an alfalfa root was found growing through a crevice in a mining tunnel 129 feet below the surface. A number of cases have been recorded where alfalfa plants have rooted 40 to 50 feet deep.

The Root System of an Apple Tree

Unlike the above ground parts of an apple tree the root system has no dormant or rest period. Root growth takes place any season of the year when moisture and temperature conditions are favorable and when food material made by the leaves is available for growth. It is generally thought that the greatest root growth takes place during the growing season when the top of the tree is growing the least. This would be between June and September. Root growth takes place to some extent during the entire winter.

The root system of an apple tree varies, depending upon the kind of soil and to some extent upon the variety and the root stock. Several 40-year-old trees located on imperfectly drained soil were examined in New York and found to root only 2½ to 3 feet deep, while trees located on a well-drained soil rooted 12 to 15 feet deep.

An apple tree root system, regardless of the soil type, has a lateral extent much greater than the spread of the branches. In any mature

orchard the roots of the different trees overlap in the middle. The roots are more concentrated immediately adjacent to the trunk and they decrease in concentration as the distance from the trunk is increased. This is true at any depth. A commonly given reason for placing nitrogen fertilizer directly beneath the spread of the branch is that the feeding roots are more concentrated at this point. The feeding roots, however increase in abundance as the trunk of the tree is approached. Trees very low in vigor can be stimulated quicker by applying nitrogen fairly close to the trunk where the roots are more concentrated per cubic foot of soil. Nitrogen, however, stimulates root branching and increases the absorbing area, and for this reason it is advisable to apply it over the entire surface, once the vigor of the orchard is built up.

On any soil type the greater proportion of the roots are contained in the upper layers of the soil. In New York State, with several hundred trees examined, growing on soil of widely different textures and degrees of drainage, over 60 per cent. of the root system occurred in the first 16 inches of the surface soil; at least one-third of the root system was located in the first eight inches of soil. A fruit grower will do well to keep this point in mind when cultivating in the orchard. I have seen shallow rooted orchards seriously injured by loss of roots from deep cultivation. It has taken some of these orchards years to recover.

Rooting Habit on Different Soil Types and Its Relation to Available Moisture

In the manufacture of food material the leaves utilize moisture and nutrients taken in by the roots and carbon dioxide which they take in from the air. These food materials made in the leaves are used in fruiting and general growth of the tree. One can readily see, therefore, how a deficient water supply would cut down the amount of food made by the leaves and this in turn affect the growth and fruiting of the tree. During periods of low rainfalls the roots exhaust the moisture supply in the upper layers of soil. If the nature of the soil is such that it produces a shallow root system the leaves cease to function normally and small fruits and little growth results. On the other hand, if the tree is deep rooted (8 to 10 feet deep) there is usually sufficient moisture to tide over a drought period. Of course, the texture and the moisture holding capacity of the soil are factors to take into consideration.

Soils vary considerably in their capacity to hold water. The amount of water a soil retains after it is saturated with water and allowed to drain is termed the field capacity. Generally speaking, the smaller the soil particles or the finer the texture, the greater will be the field capacity. A high field capacity is desirable so long as the soil is not poorly drained.

Light sandy textured fruit soils in New York State have a field capacity of 8 per cent., while heavier clay soils have values of 25 to 30 per cent.

Medium texture soils are in between. The Hagerstown silty clay loam (an extensive fruit soil in West Virginia and Maryland) has a field capacity of about 30 per cent. This means that this soil when wet to its field capacity contains 30 per cent. moisture. Not all of this moisture is available to the tree. The roots are only able to absorb about half of this amount or 15 per cent.; in other words, the tree wilts on this soil (Hagerstown silty clay loam) when it still contains 15 per cent. moisture. Likewise the tree on the sandy soil in New York is able to utilize 4 per cent. or half of the field capacity.

Let us figure the water storage capacity of these two soils in terms of inches of rainfall. We are better able to understand the importance of deep rooting when this is done. One inch of water represents about 6 per cent. moisture per foot of depth of soil. Hagerstown soil type contains 2½ inches of water available to the plant per foot depth of soil when up to its field capacity, while the sandy soil in New York is only able to store less than one inch of available water per foot depth. Most of the soils in your region begin the growing season up to their field capacity; this is due to the fall, winter, and spring rains. Thus, a tree growing on Hagerstown silty clay loam and rooting eight feet deep would have access to 20 inches of water, while the tree on the sandy soil rooting to the same depth would have approximately 8 inches. Trees growing on a medium textured soil would have an intermediate amount of available water. Dr. Magness tells us that under our condition a mature apple orchard needs four inches of water per month in order to function normally. Thus the 20 inches of available water contained in the silty clay loam is sufficient to carry the tree for five months. If for any reason the tree roots only three feet deep on a soil of this texture, it would have a storage supply lasting less than two months. A tree growing on the light sandy soil and rooting eight feet deep would have a storage supply of moisture which would last just a little over one month, and if rooting only four feet deep would last two or three weeks. From these examples it is easy to see how depth of rooting and soil textures are related to tree moisture supply.

Some of the common soil conditions which produce shallow rooted trees are:

1. Poor drainage resulting in a water-logged soil in the late fall and early spring months. While this soil is poorly drained during certain seasons, it is invariably dry and droughty in late summer when rainfall is lacking. The trees are very shallow rooted under these conditions and, therefore, have access to a limited amount of water during the dry periods.

2. Shale, slate, or rock occurring close to the surface are conditions commonly found in this section. The depth to which a tree roots under these conditions obviously is dependent upon the depth at which the shale or slate occurs. Some trees on shale soils in West Virginia were found

to root only 18 inches to two feet deep. Such trees suffer tremendously from lack of moisture during dry periods. The amount of moisture available to trees on such soils (as pointed out above) is dependent upon the depth of rooting and the available water holding capacity of the soil.

3. In rare cases rooting is delimited by a chemical condition or "hard pan" layer in the upper subsoil. I have not observed any such condition in soils of this section. It is a popular belief among many fruit growers that a heavy clay in itself restricts rooting. This is true only when the clay is imperfectly drained. If we have a soil underlaid with heavy clay, such as the Hagerstown series in which drainage is good, the trees will root to great depths. This soil also has the good quality of being very retentive of moisture. The ideal fruit soil is one which rapidly gets rid of excess water, but which at the same time retains as much water as possible during dry periods.

There is no practical operation whereby we can increase the rooting depth of the tree. This is dependent upon the inherent nature of the soil. In locating an orchard, very careful attention should be given to the nature of the soil as it influences depth of rooting. A fairly accurate estimate can be made as to the adaptability of a soil for orchard purposes when taking into consideration the rooting depth it affords and the moisture holding capacity of the soil.

It is believed by some that subsoiling and dynamiting help to increase root penetration in a slate or shale soil. Extensive experiments of this kind carried out in West Virginia have shown no beneficial effect from such treatments. In fact, there is some suggestion that subsoiling had had a detrimental effect when used in a mature orchard. No doubt this is explained by the fact that a number of roots were injured and cut from trees with an already limited root system.

Helpful Practices Where Soil Moisture May Be Limiting

Most of the trouble experienced with unfavorable soil may be traced to a water shortage for the tree at certain critical times. The problem of conserving moisture becomes important as the adaptability of the soil decreases. Moisture conservation is a broad subject and few generalities can be made that would apply to all soil and climatic conditions.

Heavy mulching with straw, cornstalks or other similar material is an excellent method of conserving moisture. A heavy application of such material reduces surface evaporation, keeps down weed growth competing with the tree for soil moisture, and—most important of all—increases rain penetration by reducing run-off. There are, of course, certain disadvantages of mulching such as mice and fire hazards. Building up the organic matter content of the surface soil by means of cover crops aids in moisture conservation by reducing run-off. Frequent mowing of sod and cover

crops during periods of drought is a good practice. Deep rooted plants such as alfalfa and sweet clover should not be grown in orchards on shallow soil because of the severe moisture competition. If cultivation is practiced in connection with a cover crop program, it should be only deep enough to accomplish the purpose. Severe injury to the roots can be caused by deep disking on shallow soils.

The value of a soil which naturally affords deep rooting cannot be overemphasized. Fruit growers should keep in mind that shallow rooted trees are less productive, more susceptible to sun scald, spray injury, winter injury, drought spot and other troubles connected with moisture shortage.

It is not my purpose to minimize the importance of soil fertility in orcharding. However, if fertility is lacking it is far easier and cheaper to correct this situation than it is to improve an inherently faulty orchard soil.

SOME FUNCTIONS OF SOIL ORGANIC MATTER AND COVER CROPS IN SOIL FERTILITY

By JACKSON B. HESTER
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Four main soil provinces extend through the boundaries of the State of Maryland. About 50 per cent. of the State lies within the Coastal Plain province, while the rest of the soils are divided between the Piedmont Plateau, Appalachian Mountain and Plateau and the Limestone Valleys and Uplands. The soils in each group differ greatly and require different methods of handling and are best suited to certain crops. Perhaps this discussion on soil organic matter deals more specifically with Coastal Plain soils, but the fundamental principles involved apply to other farming soils as well.

The Coastal Plain soils divide themselves into three general groups. The dark colored and poorly drained soils constitute one group and are represented by the Portsmouth soil in Table 1. The light colored and poorly drained soils may be considered as another group and represented by the Elkton soil. The light colored and well drained soils constitute another group. The Norfolk soil comes in this classification.

Table 1. The Organic Matter Content of Some Trucking Soils in Eastern Virginia

	Percentage	
	Organic Matter	Nitrogen
Portsmouth Sandy Loam	2.0 to 8.0	0.07 to 0.30
Elkton Sandy Loam	1.6 to 4.0	0.05 to 0.15
Sassafras Sandy Loam	1.2 to 2.5	0.03 to 0.07
Norfolk Sandy Loam	1.1 to 2.2	0.03 to 0.06
Norfolk Fine Sand	0.8 to 1.5	0.02 to 0.05

The soils in each group differ greatly as indicated in Table 1. The soils outside of these groups differ even greater. Since these soils vary so greatly in character and in the method in which they should be handled, one should know his soil. He should make every effort to know the organic matter content of the soil and use the type of crop rotation that is most advantageous for the soil upon which he is located.

Properties of Soil Organic Matter

Perhaps no other soil factor is more closely associated with soil fertility than the organic matter content of the soil. It is generally spoken of in terms of soil fertility. If a soil has a high organic matter content it is spoken of as being a fertile soil and a low content is associated with a poor soil. Perhaps this is quite right, as the building up of the organic matter content of the soil in a crop rotation system is a rather difficult proposition. For this reason cover crops should be included in the crop rotation to maintain the soil fertility.

To attribute the beneficial properties of humus to any one property that it possesses is very wrong. For example, such properties as the water holding power, bacterial activity, physical properties and nitrogen content should be generally cited. In addition to these properties, other factors that have most frequently been ignored are to be brought out in this discussion. The potential nitrogen supplying power of the organic matter which furnishes available nitrogen to plants as they grow is an important function. The breaking up of the organic matter by bacteria bringing into solution major plant nutrients (calcium, magnesium, potassium, nitrogen, phosphate), and minor plant nutrients (manganese, iron, boron, etc.), is another important function. But perhaps the influence of organic matter upon the availability of phosphorus and its base holding power are its two most important functions, particularly in sandy soils.

Soil Organic Matter and Phosphate Availability

In order to study the influence of organic matter upon the growth of crops and influence upon the availability of plant nutrients, a Norfolk fine sand of rather low fertility was brought to the greenhouse for investigation. The soil was found to have a high power for fixing phosphorous in a state unavailable to crops and to carry a low organic matter content. The organic matter of the soil was built up with peat moss from about 1 per cent. to approximately 5 per cent. The peat moss was very acid and carried a very low nutrient content, consequently about the only property that it added to the soil was physico-chemical in nature. In other words, soil clay has a high power for fixing phosphorus in a state unavailable to crops. Humus when added in sufficient quantity somewhat offsets this power and, therefore, renders added phosphorus available to crops.

Data in Table 2 show the results of the addition of organic matter to

the soil upon crop growth. Perhaps the greatest benefit was shown in the acid soil, as would be expected, for acid soils have a greater power for fixing phosphorus than soils that are more nearly neutral or only slightly acid. All of the pots were given the same fertilizer treatment. The data in Table 3, showing the availability of the added nutrients, are very interesting.

Table 2. The Influence of Organic Matter Upon the Growth of Vegetable Crops at Low and Optimum pH Values.

Norfolk Fine Sand

% Organic Matter	Relative Yield of Vegetation at Low pH Values—Very Acid Soil		
	Beets	Kale	Lima Beans
0.93	7	37	55
1.93	135	37	78
2.93	193	156	110
4.93	232	525	133
Optimum Conditions—Just Slightly Acid			
0.93	100	100	100
1.93	181	137	105
2.93	264	537	105
4.93	236	706	134

Table 3. The Influence of Organic Matter Upon the Relative Availability of Plant Nutrients for Beets

Norfolk Fine Sand

% Organic Matter	Available Plant Nutrients (The Maximum Quantity Removed at 100)				
	CaO	MgO	K_2O	N	P_2O_5
Low pH Values—Very Acid Soil					
0.93	10	22	44	40	5
193	18	32	60	63	50
2.93	26	42	74	74	61
4.93	50	75	92	91	71
Optimum pH Values—Just Slightly Acid					
0.93	24	23	52	45	33
1.93	30	36	72	62	77
2.93	56	57	100	98	100
4.93	100	100	90	100	96

In measuring the availability of the plant nutrients the procedure consisted of growing the plants in the soil, leaching the soil and analyzing both the plants and water for the nutrients removed. From the data it is also learned that the maximum availability of all of the plant nutrients

was reached at about the optimum conditions of plant growth. The great increase in the availability of phosphorus is very significant. Calcium also shows a very great increase in availability as the organic matter content increased. However, the fact that more calcium was leached at the low organic matter content than was absorbed by the plants at the point of largest growth eliminates it as being the principal factor in this test. From this it was judged that the influence of organic matter upon the availability of phosphorus was the outstanding thing to be learned from this study and since the plants were unable to absorb phosphorus where the organic matter content was low, they were unable to absorb the other plant nutrients.

With the experience above mentioned, other experiments were set up in the greenhouse.. The phosphorus (P_2O_5) in a Norfolk fine sand with a 1 per cent. organic matter content, was increased from 320 to 1804 parts per million parts of soil. On the same type of soil the organic matter content was increased to 3 per cent. with peat moss and the phosphorus (P_2O_5) increased from 376 to 1117 parts per million. The results in table 4 show that lima beans increased in yield through the highest application on the soil low in organic matter but only a slight increase in yield was registered above 556 parts per million in the soil high in organic matter.

This is borne out in another way under practical conditions of agriculture. For example, in the growth of a crop of Irish potatoes about 120 pounds of phosphoric acid are used in the fertilizer whereas only about 12 to 15 pounds are actually utilized by the crop. Again the virgin Norfolk soils around Norfolk analyze from 200 to 500 parts per million (P. P. M.) of total phosphoric acid while the old trucking soils analyze between 4,000 to 5,000 p. p. m. and they still respond to phosphate fertilization. In other words, most of our soils have an almost unlimited capacity for rendering phosphorus unavailable to crops. Likewise, every effort to increase the availability of added phosphorus should be made. Fertilizer placement may greatly aid in this connection but the ultimate state will be the same. Therefore, the addition of organic matter to the soil in the form of cover crops is to be desired.

Table 4. The Influence of Organic Matter on the Availability of Phosphorus

Norfolk Fine Sand

1 Per Cent. Organic Matter		3 Per Cent. Organic Matter	
P_2O_5 p.p.m. soil	Relative yield lima beans	P_2O_5 p.p.m. soil	Relative yield lima beans
320	8	376	35
507	10	556	84
693	19	744	86
1068	38	1117	89
1804	100		

Cover Crops

Cover crops influence the availability of plant nutrients when used in the crop rotation. Perhaps this can best be brought out in the following manner. In a system of cover cropping for Irish potatoes we have been following the system of growing a crop of Irish potatoes in the spring and following this with cover crops in the summer and fall. The soil gets a cash crop and a cover crop each year.

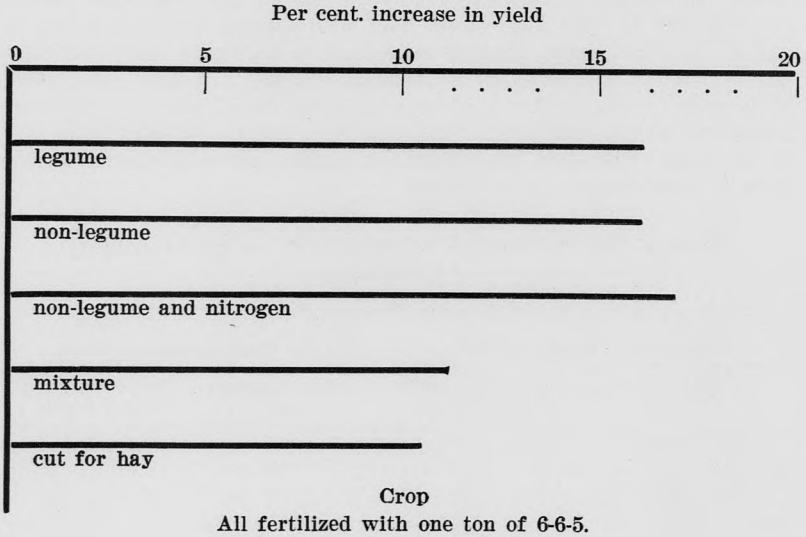
Table 5. Some Plant Nutrients Absorbed by Cover Crops

Crop*	Pounds per Acre					
	Average yield	Nitrogen	Calcium CaO	Magnesium MgO	Potassium K_2O	Phosphorus P_2O_5
Sorghum	8331	146	58	47	106	47
Soybeans	5187	184	110	45	85	34
Mixture	6756	186	95	49	99	42

*Three-year average.

The data in table 5 show the growth made by the cover crops and the quantity of plant nutrients absorbed by these crops. This study represents only the top growth. The nutrients actually absorbed by these crops are returned to the soil and to subsequent crops grown upon the soil. One

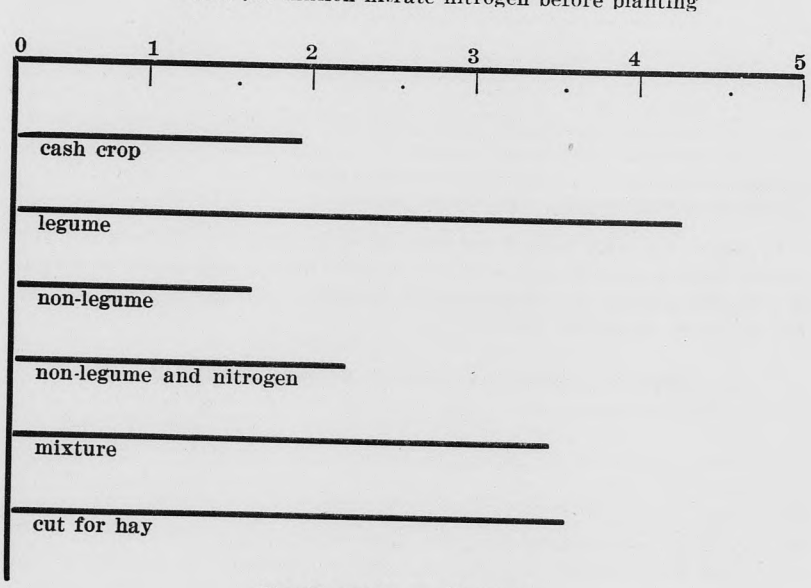
Fig. 1. Influence of Cover Crops on the Yield of Prime Irish Potatoes



All fertilized with one ton of 6-6-5.

great advantage of a crop like sorghum is the fact that it has a strong power for extracting nutrients from the soil and thus returning them to subsequent cash crops in an available state. In this system the cash crop has the additional advantage of the absorbed nutrients. The influence of this system on the yield of potatoes is shown in Figure 1. This data represents a three year average and is perhaps only slightly characteristic of what will be found over a longer period of time.

Fig. 2. Influence of Cover Crop on Nitrate Nitrogen



Non-Legumes vs. Legumes

For an organic material to decay rapidly in the soil without actually utilizing the soil nitrogen it must have at least 1.7 per cent. nitrogen on the dry basis. Therefore, a non-leguminous material turned into the soil is likely to reduce the available nitrogen at least temporarily. This point is brought out in Figure 2. These results are an average of three years. The legumes increased the available nitrogen while the non-legumes actually decreased it. This was not a serious factor in the growth of potatoes for a rather heavy application of nitrogen was used. If a large yield of non-leguminous material can be grown as shown in table 5 it may be a more economical factor to buy nitrogen and grow non-legumes.

Other Sources of Organic Matter

Many other sources of organic matter are available other than cover crops. For example, pine straw (shatters) may be used as a source of organic matter with good results. The Eastern Shore has utilized this source of organic matter for years. The figures in table 6 are an example of the benefit of this material used in vegetable crop production. It is under adverse conditions, such as heavy rainfall, acid soil conditions, etc., that organic matter is most beneficial in crop production.

Table 6. Soil Treatment and Crop Yield

8 Kilograms Soil Plus 14 Grams of Fertilizer (6-6-5) in All Pots

Order	Soil Treatment	Yield of Kale* Grams Dry Matter
1.	Natural soil	9.05
2.	Soil plus 100 grams pine shatter	26.48
3.	Soil plus 100 grams manure	24.51

*All results are an average of duplicate tests.
Soil leached twice during growing period.

In connection with table 6 the data given in table 7 is interesting. The plants utilized the nitrogen with the organic matter and failed to utilize it otherwise and it was lost through leaching. A similar thing is true for the bases shown in table 8.

Table 7. Nitrogen Balance in Removal From Soil

	Per Cent. of Total Removed from Pot	
	Leached	Absorbed by Plant
Natural soil	83.7	16.3
Soil plus pine shatter	37.5	62.5
Soil plus manure	60.6	39.4

Table 8. Base Balance in Removal From Soil

	Removed by Leaching*				Absorbed by Plant*				Grand Total
	CaO	MgO	K_2O	Per cent. Total	CaO	MgO	K_2O	Per cent. Total	
Natural soil	69.0	25.0	25.5	85	9.0	2.9	9.0	15	140.4
Soil plus pine shatter	47.0	18.0	11.0	55	24.9	12.7	25.0	45	138.6
Soil plus manure	58.0	25.5	24.5	62	27.0	11.1	24.0	38	170.1

*Milligram equivalents per pot.

Handling Cover Crops

The method of handling cover crops as a source of soil organic matter depends somewhat upon the crop rotation system followed. For example, if cash crops are to be planted soon after the material is turned under it should first be cut into the ground and later turned under. If the material is low in nitrogen (non-legumes) a supply of mineral nitrogen should be ploughed in with the crop. Usually two to four hundred pounds of Cyanamid, nitrate of soda or sulphate of ammonia is sufficient to decompose the crop rather rapidly. It is generally not advisable to wrap under a heavy crop immediately before planting. Toxic constituents are found at times under these conditions that injure crop growth that follows immediately.

Finally it might be said that for a plant to grow and thrive all of the essential plant nutrients must be available to the crop. Because they are put on the soil does not mean they are going to remain available to the plant unless soil conditions are favorable. The failure of the plant to get some one essential element prevents the growth and utilization of all other plant nutrients. Soil organic matter helps to hold the plant nutrients available to the crop. Particularly does it play a great part in the availability of phosphorus.

ENGLISH FRUIT PRODUCTION AND CONSUMPTION

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The possibility of ever regaining a proportion of our foreign trade is a question which is so basic as to demand an answer of every thoughtful American, before he can possibly achieve a reliable picture of our immeiate future. The fruit grower who today is alert to the future of the apple industry realizes that he must have a look at the world picture before he can sketch in the domestic details. We are an apple exporting country and therefore any increase in production, improvements in marketing, or change in fruit consumption abroad is a matter of vital importance to us. When our apple exports drop as decidedly as they have at present the question is then painfully impressed upon us and we are immediately curious as to reasons for the decline, and whether such conditions are permanent. So in formulating your own broader picture you may be interested in the phases of apple production and marketing which interested me intensely when I was in England, formerly our greatest export market.

English Apple Production of Increased Importance

At the present time the trend of the fruit industry in England is toward the goal of self-sufficiency. They expect to become "a not inadequate

unit in fruit production as rapidly as possible." In times past they may have relied upon small units and intensive methods but today new apple orchards has been stimulated by the successful operation by Seabrook and Sons of a fruit plantation totaling seven hundred acres. Furthermore, in the Wisbeck area, and around Worcester in West England, orchards have recently been established for the production of apples for dessert and culinary purposes.

The cider apple industry located in West England is increasing in importance. At present the plantings are largely characterized by their non-uniformity in size and age of trees, the trees being more or less scraggly and receiving little spray attention. However new planting is being stimulated by various means such as guaranteed prices for the fruit, and free distribution of trees in order to provide for the fourteen to twenty million gallons of cider consumed annually. Although forty thousand trees were planted from 1927 to 1932, there does not yet appear to be sufficient acreage to meet the demands for this popular and distinctly English beverage.

There has developed in England a strong conviction that the lack of self-sufficiency in apple production is not necessarily inevitable and that the country is well adapted, from a natural and climatic viewpoint to produce apples for its own consumption. Furthermore, the horticultural research stations have demonstrated the fact that certain of the limiting factors, once thought to be insurmountable can be controlled by modern scientific methods of production. Previously production had suffered from such adverse conditions as soil deficiences, lack of knowledge of satisfactory soil types, non-uniformity of stocks, insufficient varieties, ravages of insects and diseases, indiscrimate planting of different fruit in one location, and units too small for economical production. Professor Watson, a well-known English authority in agriculture at Oxford University when discussing fruit production in Kent, stated, "There is no branch of agriculture to which science has brought greater changes in the last twenty years."

Trends in New Plantings

We may now consider briefly the trends to be observed in these new plantings which have been undertaken in the light of past experience and with due reference to the present contributions of the research agencies.

The modern fruit growers in England have become aware that to produce fruit cheaply, mass production methods must be instituted. Consequently there is an attempt encouraged by the Ministry of Agriculture to plant units of at least 50 acres, a planting which might consist of from 3500 to 15,000 trees. This unit is considered sufficiently large to warrant the purchase of such equipment as a large apple grader, tractor power spray equipment and other modern necessities. Orchards of 100 to 125 acres of apples or pears are not uncommon.

Another very important trend is the segregation of the various kinds of fruit. Formerly as many as six different fruits were grown in a single site. Such conglomerates have made efficient spraying almost, if not entirely impossible. The demonstration of the part of the research stations that the various fruits require different fertilizer treatments has been an exceedingly important factor in determining the modern tendency toward separation of the brambles from the tree fruits. Gooseberries and currants are now usually being planted in separate locations. Intercropping during the first few years is still common but such crops are an adjunct to apple production and are not of equal importance.

Segregation of Specific Varieties of Apples—In fact, the policy of isolation reacts farther than upon different kinds of fruit. In the new plantings there is a tendency toward separation of the varieties of apples which are commonly used for dessert (fresh fruit) purposes, and the varieties which are used almost entirely for culinary purposes. This means that the principal dessert variety Cox Orange, which is considered by the English people to be the highest quality apple in the world, is segregated from the principal cooking variety Bramley's Seedling.

There is thus a pronounced tendency to plant Cox Orange on lighter soils than are utilized for Bramley's Seedling since it is known that fruits from trees grown on the heavier soils are poorer in color, and it is believed that they are also of as good dessert quality. With Bramley's Seedling there is no color acquired and large, coarse specimens of this variety are not looked upon with particular disfavor.

Segregation of these two varieties is also encouraged by the definite belief that fruits from rapidly-growing vigorous trees such as are produced by nitrogen carrying fertilizers do not possess as good dessert quality as those making a more restrained type of growth. In the minds of the growers this belief has been verified by the published work of the research agencies purporting to show that nitrogen fertilizers are conducive to decreased quality of the dessert varieties as well as to decreased keeping quality. Thus there has arisen the recommendation that dessert varieties require a different fertilizer treatment, than is demanded by those grown for cooking. As a matter of fact, it is often stated that the problem of producing high grade dessert apples under English conditions, is a question of "reducing rather than increasing the nitrogen reserves of the soil."

Furthermore in order to restrain the growth of the varieties used for dessert, the trees are grafted on what are termed "semi-dwarfing" stocks. Malling Type 2 is commonly used for Cox Orange while Bramley's Seedling is often placed on what is termed a "vigorous" stock such as Malling Type 1. Trees on the semi-dwarfing stock may thus be planted at the distances 12 by 12 feet to 18 by 18 feet. Trees on the more vigorous stocks may be planted from 16 by 16 feet to 30 by 30 feet. It is thus to

be noted that a much greater number of trees are planted to an acre in the orchards in England than in comparable orchards in this country.

Formerly orchards were often planted on uncongenial soils, but experience and surveys have gradually provided information as to the most suitable soils. Good Kent orchards are located on what is called Thanet sand, on rather light loams, and on red clay with "flints" overlying chalk. Often rock is at no great depth. In general fruit growing has extended in the direction of lighter soils, which have been improved by the application of commercial fertilizers. It is stated that the soils considered best for apple growing are the "fine working loams with less than 12 per cent. of clay and a considerable proportion of sand."

Furthermore more care is being given to the control of insect pests and diseases. The first power sprayers are making their appearance, and in a number of cases stationary spray outfits with underground mains are being used. Despite this fact 2 to 4 horse power outfits producing 200 pounds pressure are in common use. Some of the larger growers are using 400 pounds pressure with pumps delivering 4 to 10 gallons per minute.

Five or more sprays are being applied in the better orchards. The first one is the dormant tar oil wash now making its first appearance in this country. In England it is the standard dormant spray for the control of rosy aphids, caterpillars, and for a general orchard clean-up. There are, following this at least three lime-sulphur-lead arsenate sprays and one nicotine-soap spray. From observation at Covent Garden Market, it is evident that considerable improvement can yet be made in producing unblemished fruit, but the Imperial Fruit Show amply demonstrated that it is possible to produce clean, absolutely unblemished fruit in England.

The English taste is for a brisk, rather tart, quite solid, firm-fleshed apple. Almost unanimously they feel that in the way of apples the world produces nothing superior to Cox Orange. The American and Canadian varieties are considered illustrative of our preference for sweet, mild, soft, fine fleshed and rather tasteless sorts. It might be stated that in my opinion, the American varieties as they reached the consumer on the English markets were a much poorer dessert quality than the same varieties in America.

Present Limitation to Rate of Expansion

There are, at present, several factors which retard the rate of increase of apple production which in my opinion will necessitate apple importation for some time to come, assuming present consumption to be continued. These limitations can only retard rather than prevent development of new plantings.

The most important limitation at the moment is capital. It is estimated

that it takes $400 per acre to bring an apple orchard into bearing. Ironically enough capital shows itself ready to support the canning industry, while it is very wary in lending its aid to that more basic industry upon which the canning factory itself depends.

Secondly, there is a scarcity of well-trained men who are prepared to develop the industry along modern, scientific, mass production lines. Such men are available, but very often, as is the case in this country, they find themselves lacking in capital.

Another important limitation in my opinion is the likelihood of frost injury to the developing flowers and young fruits during the extended English spring. Both in 1933 and in 1935 the English apple crop suffered considerably from this cause, and as previously pointed out, English apple production has shown quite wide variations from season to season. This likelihood of first injury forces the planting of orchards on the most frost-free sites and naturally limits the land available for apple production.

Another important limitation is the lack of a sufficient succession of high quality dessert varieties. Cox Orange is almost alone in its class as far as the consuming public is concerned although some new varieties to extend the Cox Orange season past the first of January have been recently introduced. Cox Orange itself has certain definite limitations. It tends to bear rather lightly and to exhibit alternate bearing tendencies. Furthermore, fruit of this variety is expensive being outside range of a great mass of consumers. Bramley's Seedling, the outstanding culinary variety, is quite susceptible to frost.

As a matter of fact, apples in England cannot be classed as an inexpensive food item. The prices paid by the consumer at the retail stores, including the chain stores, ranged from five and six cents a pound for cooking apples, such as Bramley's Seedling to 16 and 20 cents a pound for Cox Orange, the principal English dessert variety. The general run of Canadian and American Jonathan, McIntosh and Winesaps ranged during the winter of 1932-33 from about 8 to 10 cents a pound. The sale of these varieties even at this price, was enhanced by the fact that they were cheaper than Cox Orange which usually sold for 12 cents a pound at least. Furthermore, there were many days after Christmas when the Cox Orange was not available on many of the common retail markets.

English Government Stimulates Production and Consumption of Home Produced Fruit

Obviously the new attitude of the British government toward agriculture is affecting marketing as well as production. Several important developments along this line are of interest to the American apple grower.

Naturally the competition of home grown fruit with the foreign product

is an important factor in the intensive campaign to increase home production. The home grower has had to compete with heavy supplies of apples, pears, and plums from abroad. These imports have secured their hold upon the market, in part at least, by standardized grading, packing and labeling. For many years now the principal organizations of wholesalers and retailers in England have complained regarding the irregular grading and unsatisfactory packing of the various English fruits. They have recommended in particular that a declaration of weight should be required on every container of the various fruits marketed. In consequence the government established in 1931 the system known as the "National Mark," which serves at least to equalize the weapons of trade warfare. The legislation establishing the National Mark prescribes grade designations for certain kinds of agricultural produce, including the various fruits, and defines the quality indicated by such designations.

The use of the standard grade and package designated in the provision enables the home producer to put a standardized and dependable product on the market under a guaranteed of home origin as well as of weight and quality. At the same time he "facilitates the preferential buying of the home grown product." The publicity which has been given the National Mark during the last few years has focused the attention of the public upon home produce, and the National Mark has now attained considerable value as an advertising agent.

The "preferential buying of the home grown product" has also been aided by the "Buy British" campaign. This movement includes the produce of all the British dominions and territories. The exhortation "Buy Empire, both at Home and Abroad," is constantly before the eyes of the English public, one which is singularly docile in following the national recommendations. Placards urging the consumers to "Buy British" are placed directly above the fruit so as to attract the buyer's attention. In addition, Canadian fruit is conspicuously labeled, "Empire Grown" or some other similar designation while that from the United States is very frequently labeled "Produce of U. S. A."

Finally, the home grown produce, as well as that from the Dominions is aided by the recent tariffs which have been applied to foreign produce under the "Import Duties Act." Any objection to this measure is met with the statement that such a duty should have existed for the past 50 years. In fact, it is generally accepted opinion that in the case of horticultural produce, the present policy is a definitely established principle. It is hoped, moreover, that this tariff will induce the complete displacement of American apples by Canadian fruit, and complaints are even now being made that the tariff is not high enough to prevent the "dumping" of American apples, and that it must therefore be raised.

Future of American Apples in England

What is the future of American apples in the United Kingdom? F. Motz, American fruit representative in England has stated that patriotism does not enter into the sale of apples. The inference is that people will buy cheapest fruit and that American apples are cheapest. Unquestionably there are millions of people who, despite patriotic appeal will buy the cheapest apples, but American apples are no longer cheapest. American apples during the season of 1932-33 were selling on the English fruit stands for exactly the same price per pound as Canadian apples which, because of the "Buy British" stimulation, would receive the preference. On the other hand price is the deciding factor in the case of Cox Orange which, were it four cents a pound cheaper, would become preferable. When Cox Orange is produced in sufficiently large quantities to permit selling at from six to ten cents a pound, a large proportion of the consumers will turn away from Canadian as well as American apples.

Final Considerations

1. In the writer's opinion the American apple grower must definitely expect that American apples will be largely if not entirely displaced by the Canadian fruit in the immediate future.

2. In the meantime American apples intended for export should be more carefully handled as regards picking, grading and packing.

3. Greater care should be given to maintaining a uniformly high quality throughout the package.

4. More attention might profitably be given to the time at which American apples reach the English market in order to avoid competition with the height of the English season.

5. Sale of American apples abroad would appear to be sporadic except when arranged for by means of bargaining agreements or special reciprocal arrangements.

6. If and when American apples are confined to a domestic market definite arrangements for planned apple production in the United States will be necessary.

DISEASE CONTROL WITH MILDER FUNGICIDES

By W. C. DUTTON
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I feel rather hestitant about coming from Michigan to Maryland to talk to you about disease control. There are good reasons for this hesitancy. One is the fact that you have your own investigators here in the State who are in the best possible position to advise you. Another reason is the extreme difference between Michigan and Maryland in many respects such as critical periods of scab development, different groups of varieties with variations in susceptibility to apple scab and spray injury and still another season in the difference in climate which has such an important bearing on disease development and control and on spray injury. For instance, I am told that it is generally not necessary to start scab control operations as early relatively, in this latitude as we usually recommend in Michigan. I think, however, in spite of the many differences between the two districts that I can discuss with you to advantage some of the basic considerations involved in pest control, and these basic considerations apply wherever spraying is done.

I am going to discuss the recommendations we make in Michigan and the reasons for such recommendations but I want to make it perfectly clear that I am not advising any Maryland fruit grower to follow our spraying practice because it might not fit here. I believe, however, that some consideration of the principles back of these recommendations may be of value to some growers who have had trouble with apple scab or certain types of spray injury.

The ideal procedure would be one that would give perfect control of apple scab without causing any injury to fruit or foliage or leaving any undesirable residues on the fruit. Do you know of such a procedure? I do not, but let us consider a method of approach to this ideal.

Michigan Procedure. Our recommendations in Michigan for the control of apple scab and codling moth are based on the principle that the most important step in the control of these pests is to stop the initial or primary infection or infestation. In fact, we have had a slogan on the front of our spraying calendar which says "Stop apple scab in the preblossom period; stop codling moth in the first brood." I am not going to talk in detail about codling moth so we may confine our discussion to the scab control program.

Critical Periods in Scab Control. I like to think of the season when we are likely to need to pay attention to scab control as falling naturally into two periods which are separated by the blooming period of the tree.

We have the "prebloom" or "before bloom" period and the "post bloom" or "after bloom" period.

In Michigan, the apple scab spores are usually mature in the old leaves by the time the trees are in the delayed dormant stage of development. It is possible, therefore, for scab infection to occur any time in the prebloom period provided conditions of moisture and temperature are favorable. The truth of the matter is that we get, on the average, in bad scab years, light spore discharge early in the prebloom period a little more in the prepink and probably the bulk of the discharge just before or during bloom, with sometimes some primary discharge soon after the petal-fall period but rarely much of consequence after that. All sorts of variations from this condition can and do occur but it is the typical condition. There are some seasons when the scab spores are mature at the period indicated but never discharge heavily because of the lack of favorable rains. That condition was true in 1934 when many orchards could have been left unsprayed so far as scab control was concerned. Most of our growers are not equipped to cover their orchards in a few hours after the weather man predicts rain so the general procedure by most of the best growers is to work on the theory that every year will be a scab year. They spray in the delayed dormant period and as often thereafter as is necessary to keep all new growth covered, with particular attention to spraying as late as possible before the blossoms open so as to afford maximum protection during the blooming period. The desirable procedure after the blooming period is an application of a fungcide at rather low concentration at petal fall and a still weaker application about ten days later. If good work has been done as indicated it is rarely necessary to spray for scab later than the ten day application.

This discussion has indicated definitely that the critical period in scab control is usually early in the season, which means that the applications in the prebloom period are the really important ones to prevent primary infection. If the primary infection is prevented, there is little to worry about later, but if it is not and there are favorable rains in the period following petal-fall there can be plenty of trouble. The general picture for the pre-bloom and post-bloom periods is the rather frequent and thorough use of relatively strong fungicides, such as lime-sulphur, in the prebloom period and of less frequent applications, in the post-blossom period, of much lower concentrations of liquid or dry lime-sulphur or even better, some one of the elemental sulphur sprays, usually referred to as wettable sulphur.

Critical Periods for Foliage Injury. We must spray thoroughly with some effective material in order to control scab but when this is done foliage injury often develops and if injury is severe we may do more damage than good. In this connection, it is fortunate that spray injury is least significant in the period when it is most important to spray fre-

quently with the more effective type of materials. I refer of course to the prebloom period. At that time there is relatively little foliage to "burn" and the after effects of injury that may occur usually are relatively unimportant provided the trees are in a good state of vigor. On the other hand, in the post-bloom period, there is much new foliage that is tender and very susceptible to injury. If scab has not been controlled, the danger of injury is much greater. Temperatures are likely to be much higher so that sulphur injuries of all kinds are more likely to occur. We have, therefore, an unfavorable combination regarding injury:— much foliage that is likely to be susceptible to injury and weather conditions favorable to injury development.

Effects of Injury. I have previously indicated that while injury may occur in the prebloom period the effects of such injury usually are not serious. Such injury however, should be avoided whenever possible. Foliage injury that occurs in the post blossom period cannot be dismissed so lightly as the secondary or after effects of such injury may be serious indeed. The first and most apparent effect is usually on the crop of that season. Fruit may drop excessively so that the crop is reduced, russeting and other injuries to the fruit itself may occur, and as a result of reduction in leaf area or reduced functioning of the persistent leaves the color, size and quality of the fruit may be reduced. A somewhat less conspicuous but really more serious effect of foliage injury is the influence on fruit bud formation and on the general vigor and productiveness of the trees, especially if injury occurs year after year.

Materials and Methods. It is impossible to state any definite rule as to the material that is best under all conditions, with all varieties or with all operators. The general practice in Michigan is to use liquid lime-sulphur in the prebloom period at relatively high concentration and in the post-bloom period to continue with lower concentrations or to substitute a wettable sulphur or flotation sulphur. The concentration may vary in the early applications from 2½ gallons in 100 with very susceptible sorts in orchards that are sprayed lightly down to 1½ gallons or even 1 gallon in 100 where the spraying is done very thoroughly and frequently. It is very desirable, in fact, to lower the concentration of any material when the applications are made heavily and frequently. Many growers continue to use lime-sulphur in the post-blossom applications and often at higher concentrations and later in the season than is necessary, but there is a tendency to change for these applications to flotation sulphur or one of the wettable sulphurs. We have found, in general, that the following comparative values are accurate: 1 gallon of liquid lime-sulphur, 4 pounds of dry lime-sulphur and 4 to 5 pounds of dry wettable flotation sulphur are approximately equal in *preventing* scab infection. Some of the wettable sulphurs have about the same value as flotation sulphur but others apparently are much less effective.

Liquid and dry lime-sulphur will both "burn" under some conditions but such injury is usually most severe, with equivalent concentrations with the liquid lime-sulphur. Injury from them increases in direct proportion to the concentration, that is, 2 gallons of liquid or 6 pounds of dry lime-sulphur is likely to cause much more injury than 1 gallon of liquid or 4 pounds of the dry. Flotation and wettable sulphurs have rarely caused any injury in Michigan but injury has followed their use in other districts when very high temperatures have prevailed.

An important fact about lime-sulphur injury is that the foliage is most susceptible to, and conditions otherwise most favorable for, the development of injury in those years when apple scab is worse. This makes it extremely important that the major part of the scab control program be confined as much as possible to the early part of the season.

Most of this discussion has had to do with materials and the inference might be drawn that the fungicide used is the all important item in scab control. Materials are important, but *thoroughness of application is equally or more important than the material used* The most effective material is often worthless when improperly used. It has been found in Michigan that lack of complete coverage, especially in the top of the trees is an important factor in failures to control apple scab. It is equally desirable that spraying operations be started ahead of the first scab infection period and that the coverage be renewed at frequent intervals and all new growth covered as it appears, especially during the prebloom period.

NEW DEVELOPMENTS IN SMALL FRUITS

By GEORGE M. DARROW

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Records furnished by Mr. M. D. Moore, the county agent for Washington County, Maryland, indicate that there are about 510 acres of black raspberries, 176 acres of red raspberries, and 65 acres of blackberries in this immediate vicinity. The yields of black raspberries were good in 1933 and poor in 1934 and 1935. Even the average for 1933 of some 50 bushels per acre is not large, and the yield of about 20 bushels per acre for 1935 is low for profitable production. Management surveys have shown that high yields per acre are necessary for profitable production and that for high yields good stands of vigorous plants are necessary. As compared with the survey made by Messrs. Ross and Auchter in 1927 your acreage of black raspberries has increased but your yields have decreased. Since that time the production of red raspberries has become commercially important and the acreage of blackberries has more than doubled. At least, compared with other crops, apparently berries have been profitable.

Varieties

No new variety of outstanding importance has been introduced to replace the Cumberland. However, of the new black berries the Logan is an excellent early, Black Beauty, a berry of very fine quality, is a good midseason, and Naples is a good late sort 3 to 7 days later than Cumberland. These are worth trying and may be somewhat, though not a lot, better than older varieties. From our tests the Naples seems to be the most promising, being more resistent to leaf-spot and anthracnose under our conditions than Cumberland.

In the red raspberry group the Latham is still the standard sort but late. The Chief is about ten days earlier in quality, but not as large or productive as Latham. Recently several fine new sorts have been introduced that are better than Latham where they can be grown. However, the Newburgh, which is larger, firmer, and much better in quality, is very subject to anthracnose and leaf spot this far south and probably can not be grown here even with thorough spraying. Viking is much like Cuthbert though more productive. Like Newburgh, however, Viking is so subject to leaf spot and anthracnose that it can not be grown here. A new variety just named the Taylor by the New York Experiment Station is larger, longer, and of much better quality than the Latham and is worth trying. It seems to be relatively resistant to leaf spot and anthracnose and is a very attractive berry.

No purple raspberry has been fully satisfactory until recently when the Potomac was introduced by the U. S. Department of Agriculture. It is disease-resistant, productive, and perhaps the hardiest of all raspberries. The New York Experiment Station has just introduced the *Sodus*, another fine purple raspberry. It is large, firm, of good quality, and disease-resistant. It is probably slightly larger and nearly as firm as Potomac but not quite so attractive. For those who know the purple raspberries, and for sections having a market for them, there are now two good varieties available.

There are no blackberries which are greatly superior to Eldorado. The Alfred from Michigan is promising and may prove a little superior to Eldorado. The Pocono and Russell from New Jersey are good and may be worth trying. The Brainerd, ripening after the others are through is of the Eldorado type of fruit though not as sweet until fully ripe. It has a very vigorous semi-trailing growth and may not be fully hardy here except in protected locations.

Some of you have tried the Young dewberry or Youngberry and have found it too tender for a commercial sort. Last winter a new variety, the Boysen, a berry of the same type, was introduced in southern California. Though it has not been tested in the Eastern States before this year, it is worth trying. Its fruit is of remarkable dessert quality and size.

Culture

Perhaps the most striking change that has come about in recent years in raspberry growing is the general practice of spraying. It has been amply demonstrated that to succeed in raising red raspberries this far south they must be regularly sprayed to control anthracnose (gray bark) and leaf spot. Now we know also that the reason many varieties of raspberries are not hardy here, while they are hardy north into Canada, is that in this section leaf spot and leaf rust defoliate the canes in mid and late summer. Food reserves are not then accumulated in sufficient quantity to make the plants hardy, and they are partially or entirely killed by the winter cold. Leaf spot has been severe for the last few years, and Latham has been badly injured wherever it has not been sprayed. Sections having hundreds of acres of red raspberries have almost entirely discontinued raising them because the necessity of spraying was not realized soon enough. There are probably no varieties in the trade resistant enough to make it unnecessary to spray except perhaps in New England, New York, and other northern States or at high elevations.

Much has been heard in recent years regarding the soil-acidity range at which berries and other crops grow best. At the Norfolk, Virginia Experiment Station the range of soil acidity at which strawberries grew vigorously was directly related to large amounts of organic matter in the soil. Soluble aluminium, which is considered to be the injurious element in the soil when soils are very acid, disappeared when large amounts of organic matter were added. In a soil with over 7.5 per cent. organic matter, plants grew well at a pH of 4.6 (strongly acid) while, with less than 1 per cent. of organic matter, plants did not grow well at a pH below 5.8 (medium acid). With a high humus content, strawberries and other crops grow well over a wide range of soil acidity.

Experiments by the U. S. Department of Agriculture at Chadbourn, North Carolina have shown striking effects of fertilizers on the acidity of the soil and the growth of strawberry plants. The acidity decreased when nitrate of soda was used and increased when ammonium surfate was used. In these tests on soils already acid, as high as 90 per cent. of the plants died after applying 150 pounds of sulfate of ammonia twice a year. Similar results might be obtained by applying equivalent amounts of nitrate of soda to soils already alkaline or nearly neutral.

Handling

A recent bulletin, No. 318, from the Minnesota Experiment Station, confirms earlier work on the relation of time of day to temperature of berries and their keeping quality and on the relation of careful handling to keeping quality.

The keeping quality of raspberries from eight different pickers was compared. After six days, berries from three pickers had 10 to 12 per

cent. decay and from three others 70, 80, and 95 per cent. decay. Red raspberries picked from 7 to 9 o'clock in the morning had 15 to 20 per cent. decay after four days while berries picked from 10:00 a. m. to 1:00 p. m. had 65 to 95 per cent. decay. Even if berries picked in the middle of the day were cooled, those picked early in the morning and late in the afternoon kept much the best.

Raspberries picked early in the morning warmed up a little during the day but were always much cooler than berries picked later in mid-day. If the berries were put in a well ventilated shed they cooled to a temperature below that of the air, the cooling being mainly due to evaporation. When placed in a cool cellar as soon as picked, the berries did not cool so fast as in a well ventilated shed or in the shade of a tree. For example, after an hour a crate of berries in a cool cellar at 59° had cooled 3.5° while those under a tree had cooled 7.0°. Berries, kept in a refrigerator at 45° to 48° for even 2 to 3 days, kept longer after being taken out than berries not put in the refrigerator at all. Cooling them in the refrigerator seemed to harden them. Berries were also put in the refrigerator for different lengths of time to determine their keeping qualities after being taken out. After 24 hours, the longer they were in the refrigerator the shorter the length of time they kept when taken out. A delay of more than five hours in putting the berries into refrigeration greatly reduced the length of time the berries remained in marketable condition.

This discussion is intended to summarize the information on recent research work of immediate interests to growers in western Maryland and vicinity. Many new varieties of berries have been introduced in recent years that are becoming leading sorts. Many other promising new varieties are in the hands of breeders and will be on the market in a few years. Only by testing these yourselves or by obtaining the experience of others can you estimate their value for your conditions. This holds true for new cultural and handling practices also. In conclusion, I wish to invite those interested in breeding work to visit our station at Beltsville, Maryland, to see new varieties in fruit. Chiefly the new varieties to be seen there are strawberries, but we have some new raspberries and blackberries there also.

IDEAS THAT MAY BE OF BENEFIT FROM OUR EXPERIENCES

Pennsylvania Experiences

By H. F. HERSHEY

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The primary object in growing apples is to grow the greatest number of bushels of U. S. No. 1 fruit annually that it is possible to grow. High average crop yields of necessity reduce production cost per bushel so that, even in low price years, such as the 1935-36 season has been so far, there may be a slight margin of profit over the cost of production. Assuming an orchard which is in ordinarily good condition, I believe that one of the more important limiting factors of high annual production is the lack of proper cross-pollination. Admitting that weather conditions, over which we have no control, are also a factor in limiting high annual production, our experience over the past five years shows that the lack of proper cross-pollination is a decided limiting factor to high annual production for many varieties of apples.

Our experience with a block of 1600 Delicious may be of interest to our Maryland friends and growers, and I give you its history and our present method of handling it. This block of trees was planted in 1913 and is now twenty-three years old. The trees were originally spaced 18 by 18 feet apart but eight years ago, one row of trees consisting of half Stayman and half Delicious were removed. This left the trees 18 feet apart in the row and the rows 36 feet apart, the trees being still too close for best orchard practice. The block was planted entirely to Delicious and Stayman, and with the Stayman out, the block is practically Delicious with the exception of some stray trees which were mixed in planting. These mixed varieties, of which there are not more than fifty trees, are Fameuse, Gano and a few other nondescript varieties.

Up until eighteen years of age, the average annual crop of Delicious was between two and three bushels per tree. Seeking a solution of the cause of the light annual yields, we were told that the Delicious here in the East is notoriously late coming into bearing, this in spite of the fact that after ten years of age they bloomed heavily practically every year. Our observations showed us that the Delicious along side of the stray trees and along one side of the block, close to some Grimes, always had a crop whenever they had bloom, and we finally concluded that our light crops were due to the lack of proper cross-pollination. Many of the Delicious trees, not close to the "Pollinators," hardly ever bore any appreciable amount of fruit, making the harvesting of it a laborious and costly operation.

Five years ago we started to topwork the Delicious and now have a scion of a pollinating variety in seven-eighths of the trees. We have used

Grimes, Transparent, Golden Delicious and McIntosh, and due to its being such a vigorous grower and an annual bearer we like the Golden Delicious, but used the different varieties so that we might have some insurance of having some bloom every year. We used yellow varieties mostly for top working, so as to be able to keep the varieties separate in the packing house. At the same time that we started to topwork these trees, we bought about 1,000 ten-quart buckets and started placing bouquets in the trees. Immediate increased production was noticed and the average yield per tree for four years was approximately six bushels. Bouquets are a valuable adjunct in an orchard needing cross-pollination, but in hot, sunshiny weather are difficult to handle, and it is sometimes almost impossible to get the bloom into the buckets without wilting and to keep it from drying up afterwards. We always use Transparent bloom if we have it and have found it very satisfactory, although we have used Grimes and Gano successfully. One season when the bloom dried up prematurely we refilled the buckets with Rome bloom and we thought that we had good results with it.

In the spring of 1935 practically all of the scions had a good set of bloom and in addition we placed Trasparent blossoms in buckets in the trees which did not have any bloom on the grafts. Every Delicious tree in the block had either a graft with bloom or a bouquet in it. Scattered over the whole area, in groups of three to five, averaging one for each acre, were colonies of bees. While the blooming period was dark, rather cool and cloudy, it extended over a period of about ten days, during which time the bees were able to get in a lot of pollinating work, although some days only for an hour or two. The Delicious were set so heavily that at least half of the apples were removed in thinning and the result was an average of ten bushels per tree. Plenty of good strong colonies of bees and bloom for cross-pollination did the trick.

Our treatment of the bees may be interesting to you. We have a man, who knows and likes bees, takes care of them, and he receives two-thirds of the honey for his pay. We own the bees, buy all supplies, and every spring add two pounds of package bees from the south to each colony so that they are good and strong and have plenty of bees to fly during the blossoming period. If we did not receive one dollar in return from our investment in the bees, we would consider it cheap crop insurance. After the blooming period is over, the bees are removed from the orchard and placed about a mile away so that there is no interference with orchard operations.

These are the interesting results that we have had in our block of Delicious and the same results may be secured with Stayman and many other varieties. I understand that the Extension workers in our State have secured some outstanding results in cross-pollination of Yorks, a variety which is generally considered self-fertile.

Another experience that we had the past year taught us that it pays well to keep the spraying program, especially for the control of scab, up-to-date and on time as given by our Spray Service. To use our block of Delicious again as an example, one-half of it was covered well and on time. The result: 85 per cent. of U. S. No. 1 apples. The other half of the block was sprayed several days earlier with two days of rain in between and not gone over again. The result: 40 per cent. U. S. No. 1 fruit, 40 per cent. Utility and the balance cider and canning stock. It seems foolish to take a chance on the slight additional cost of an extra spray and to gamble on the weather. To keep our spraying program up-to-date means plenty of equipment and sprayers overhauled in the winter so that they are ready to go when spraying time is here.

One of the newer developments which has interested both the producer and the consumer is the growing popularity of some of the newer varieties of peaches. It seems altogether possible that within a few years we may have an altogether new list of varieties, and the varieties which are popular now and have been so for the past few years may soon be as obsolete as the Crawfords of thirty to forty years ago. We have grown a few of the newer peaches and will give you our reaction to them as grown under our conditions on a Berks shale soil in the foothills of the Blue Mountains fifty miles west of the Delaware River.

Pioneer. A white peach in season ten days ahead of Carman, medium in size, slightly cling unless fully ripened on the tree, when it is free. Quality is exceptionally good, but is too tender for distance shipping. Very hardy in bud and came through the past two winters of very low temperatures with full crops. A good early roadside sort.

Cumberland. White, free and of good size if thinned hard. Quality of the best and of attractive appearance. Apparently as hardy in bud as Pioneer. Did well for us on the Philadelphia market last year. A good roadside variety as customers come back and ask for it. A few days later than Pioneer.

Golden Jubilee. Yellow, freestone, and in season about with Carman. One of its faults may be that it does not set very heavily and is probably not any more hardy in bud than Elberta. A very fine flavored peach and in demand on the large markets. Ice cream makers are finding it one of the best flavored peaches for making ice cream.

South Haren. Yellow, freestone and in season about ten days before Elberta. Of good appearance and quality but inclined to rot and growth crack in wet weather. Very hardy in bud and a good yellow peach in its season. Has done very well in different sections of Pennsylvania.

Primrose. Yellow, freestone, ripening a few days before Elberta and overlapping the Elberta in season. Very good quality and color. With

us it outsells Elberta on the local market because of its high color and fine quality. Produced a full crop after the low temperature of the winter of 1934 and about 25 per cent. of a crop after the low temperature of 1935. New Jersey also reports it quite variable in hardiness of bud.

Hope Farm. White and not generally altogether free. It is a few days later than Elberta and resembles the Belle of Georgia but under our conditions is much below the Belle in quality.

These are the newer varieties which we have grown in a limited way. Numerous other new varieties are being catalogued and some are pushing their way to the front. Apparently no new variety is yet in sight to push Elberta off its throne much as we need a high quality yellow peach for this season.

Virginia Experiences

By C. PURCELL MCCUE

President, Virginia State Horticultural Society

Greenwood, Virginia

It is a pleasure to be with you and to meet with the fruit growers of our neighboring States. I bring to you the greetings of the Virginia Society, and our sincere wish that the New Year may result in profits that the fruit growers so richly deserve.

My father started planting Albemarle Pippin and Winesap apples forty-one years ago this spring on the place where I now live. Our place is located on the southeast slope of the Blue Ridge, about 950 feet elevation. We look upon Pippin trees, forty-one years old, as being in their prime.

I have found that the orchard business gives a man, perhaps the greatest opportunity of any, to find out first-hand how little he knows and with continued emphasis. One year a fruit grower may think he has learned just how to handle a certain problem; the next season, weather and other changeable factors may completely upset his former conclusions, leaving him bewildered, though not discouraged.

We, perhaps, bought the first power spray in our section. Prior to this I had spent many a day wrestling with the handle of a hand pump. In its scientific development of spraying and spray materials, fruit growing has probably kept pace with the trend of other business and manufacturing enterprises, but in merchandising, i. e., marketing and advertising, the industry has progressed but little in the past generation. The one thing that has impressed me most forcibly this season is the lack of advertising of Eastern apples, or, to state it more correctly, the failure to give our fruit and its many uses the publicity necessary to compete with other

foods for a just portion of the housewife's dollar. American business is spending about one billion dollars annually in advertising—it must pay.

Here in the East we are so close to the principal markets of the country that most of us have thought that if we could make a profit on our apples equal to that of the cost of transportation from the Northwest, that we would be satisfied. We felt that the Northwest growers must have something in the way of profit on which to live, but here again our idea seems to have been upset, for in recent years the Northwest apples have been driving the markets to lower and lower price levels until our profit margin has all but vanished. How the Northwest grower lives I am unable to tell. The factors that account for his continuous operation seems to be the generous loaning policy of our beneficent government; higher yield per acre; efficient merchandising backed by effective advertising.

At the recent annual meeting of the Virginia Society, the most convincing evidence of what the rest of the world thinks of advertising was contained in a display occupying a space 22 feet long and 10 feet high, completely covered with posters, labels, window stickers and other attractive colored lithographs used by the growers and sellers of fruits from all parts of the world, such as Australia, Tasmania, South Africa, Jaffa, Canada, New Zealand, and many other competing fruit growing countries. It made a most impressive display that spoke louder than words.

We in Virginia last summer started out to learn what the sentiment of the fruit growers was towards advertising and whether or not they would be inclined to contribute a sufficient amount upon a per package basis to defray the expense of a conservative project. This we had hoped to carry on in cooperation with the growers of West Virginia, but after a careful survey of the growers' attitude and crop conditions at that time, it was decided to postpone the effort until another year. I sincerely hope and feel that there has been a sufficient change in the attitude of the average grower to enable us to start our advertising project during the coming year, if crop conditions warrant. It is our hope that the plan will be started, not for one year, but for a sufficient period of years to prove its worth. It should be started modestly and gradually expanded as we gain experience in this new field of activity.

Orderly marketing or distribution of Virginia apples is a subject about which I know very little. However, I am thoroughly convinced that some plan will have to be worked out by which our fruit will flow to the markets in a more uniform supply. The glutting of both our domestic and foreign markets, of which we are guilty each season when the crop is large, will cease only when growers more generally understand the principles of merchandising. We must develop a system by which a uniform, dependable flow of varieties suitable for the season will reach the markets only in proportion to their ability to consume.

There is another matter of interest that our secretary brought to my attention after his tour of the Southern apple markets this past fall, and that is the apparent demand in most of these markets for Eastern basket apples, to be packed in quarter inch sizes with the minimum count stamped on the basket. This is to meet the competition of the Northwest box pack with its uniform size and count. It is another problem that will have to be approached very carefully, and the standard of count for the various sizes should, in my opinion, be established by the United States Department of Agriculture, only after careful tests have been made. The stamping of a count greater than the minimum number of apples in the package would be suicide.

Marketing authorities have suggested the importance of placing the label or identity mark on the side of the basket rather than on the top. Under the present practice of labeling and stamping on the lid of the basket, the package loses its identity as soon as the lid is taken off, because the lid is usually discarded.

We also had the pleasure at our meeting of having an address by Mr. Aubrey Milan, a leading fruit and vegetable jobber from Atlanta, regarding "The Future of Virginia Apples in Southern Markets." When he spoke of Virginia apples he was addressing Virginia growers, but the trade does not discriminate between the apples from the different sections of the Piedmont-Shenandoah-Cumberland districts. Mr. Milan emphasized that the time was never more favorable than now for this district to put in apples in Southern markets in greater competition with the Northwest, but we must be particular to give them the proper grade, correctly branded.

In conclusion, I would emphasize that while there is much progress yet to be made in the growing, packing and grading of our fruit, the developments that we have made along these lines within the last few years leaves me confident that the growers will meet these problems as they arise, but that the important unsolved problem about which there is a decided lack of interest and effort is that of distribution, merchandising, advertising. We are like a fondling kitten with but one of its eyes open; we have yet to open our other eye. Advertise!

West Virginia Experiences

By JOHN Y. MCDONALD

President, West Virginia State Horticultural Society
Charles Town, West Virginia

During the past two years the West Virginia Horticultural Society has increased its membership from 200 to 300. This increase is due to the fact that the society has been active and aggressive. Our efficient secretary is also connected with a daily newspaper. Most of our members take this paper and through it are informed promptly of the society's actions. The "Mountaineer Grower" comes out monthly and compares very favorably with similar publications by neighboring States.

For a number of years our society has labored hard to lower freight rates on apples. Recently, we have endeavored to delay a reduction of 20 per cent. on Northwestern apples into the East until we are granted an equal reduction. Our representatives have attended conferences in New York, Washington and Atlanta. Virginia has been our most efficient ally in this battle. We think that Maryland and Pennsylvania should take a more active part in this continual conflict. We have spent much money and time, but feel that it has been more than justified. Reductions averaging 25 per cent. have been obtained into the South. Box apple rates have been lowered to Chicago and New Orleans, but thus far the $1.25 rate continues in this region—our main market.

We were also successful in having West Virginia trucks, hauling unprocessed agricultural products, exempted from large increases in license fees.

Due in a large measure to Senator Byrd and the Virginia Society, Eastman has not yet gotten full control of the trucks hauling interstate. Doubtless it will cause a large increase in trucking costs if he does gain full control. We shall continue to battle for the trucks.

We labored to have the Copeland Bill drawn so that it would not further handicap apple growers.

Perhaps we put forth our greatest effort to prevent apples from being put under the AAA. We felt the growers of other sections might dominate this marketing agreement so that it would injure us. We felt that it could not be enforced and might work to the benefit of the dishonest, also that an effort to raise the price of apples by the AAA would probably mean prohibiting the sale of a part of the crop. This would encourage the use of substitutes for apples. I expected some West Virginia growers to favor the AAA plan, but thus far have found none.

Our former president, Dr. A. B. Eagle, began a series of luncheons for

apple salesmen during the most active shipping season. Each man pays for his own lunch and an open discussion is had. Members discuss the probable price and confirmed sales of apples soon to be shipped; also maturity, inspection and other timely matters are brought up. No one is asked to tell all he knows, but the meetings have done much to make prices more uniform and encourage a more friendly feeling between the selling agencies.

Our society holds frequent executive meetings, averaging about one a month, but in urgent times much oftener. Most of our executive committee live close to Martinsburg, where the meetings are held.

Our society took a booth and made a display at the Baltimore Food Show in the Armory in Baltimore. It was mainly educational, although we sold enough apples and apple juice to pay all expenses. Some of our progressive growers contributed apples; others took turns going down and presiding at the exhibit. The show was attended by over 100,000 visitors and, I think, was well worth while. Maryland should join with us next year, as well as Virginia and Pennsylvania. With this aid we could make a much better exhibit.

Lack of funds prevented our doing much that we might have done to advertise apples; for example, we should have exhibited at the Hartford Show. We did put on an apple show at Martinsburg. The exhibit was creditable and the publicity gained was well worth the cost, about $200 above returns. Among our distinguished visitors was Governor H. G. Kump, who crowned Harry W. Miller the apple king for 1935. We expect to continue the show next year with improvements and expect greater success and larger attendance.

Right now we have a strong committee working on a plan to voluntarily reduce the number of apples grown in West Virginia. This committee will present their plan at our convention February 6 and 7.

The Eastern Apple Growers' Council has accomplished little and in its place I suggest a little "entente." Let each State in the Shenandoah-Cumberland region have representatives, possibly three, on this committee and have them meet at least semi-annually. There was never a time when more needed doing to aid the fruit growers. While each State can accomplish much, our "entente" could be even more effective on many matters.

CODLING MOTH AND ITS CONTROL

By H. N. WORTHLEY

Entomologist, The Pennsylvania State College
State College, Pennsylvania

Although national in scope, the codling moth problem remains essentially local in character, for in each separate apple-growing region of the country the insect finds itself under a different set of environmental conditions. For this reason control methods developed in one part of the country may or may not help to solve the problem in other sections. I recognize this fact, and do not intend to argue the adoption in Maryland of control operations that prove to be useful in Pennsylvania. My presentation of the subject of codling moth control will deal with two lines of attack that have done most to solve the problem in his State.

In all sections, spraying continues to constitute the first line of defense against codling moth damage, and the density of the codling moth population in a given orchard must determine the intensity of the spraying effort. To illustrate this point roughly, we may say that 20 worms per tree can be reduced to 10 by a 50 per cent. job of protection, while 100 worms can be reduced to 10 only by a 90 per cent. job. For this reason alone we sometimes see our grower producing a cleaner crop than his neighbor's, with fewer sprays.

Now, assuming that an adequate schedule of sprays is adopted, success rests upon three things—timeliness, thoroughness, and the use of proper materials. Strangely enough, once the date of the first cover spray has been determined, timing is of least importance in heavy infestations, for thereafter it is a matter of nearly continuous spraying to maintain proper coverage throughout the period of attack. Dangerous numbers of newhatched larvae are always present. But in lighter infestations numbers sufficient to warrant a spray application are present only at intervals, determined by the seasonal course of codling moth development as affected by local conditions of weather. Here wasteful spraying can be avoided only by the determination of these scattered danger periods.

The timing of spray applications for codling moth control, with the aid of bait traps and moth emergence cages in the orchards, is now well understood, and needs little discussion here. In Pennsylvania orchardists in each of the chief apple-growing counties now operate bait traps in cooperation with the Extension Entomologist. The records taken assist materially, not only in setting the dates of successive cover sprays, but also in revealing the size of the population and allowing judgment as to the necessity for late season sprays.

Thorough spraying, the second essential, is of paramount importance.

Unfortunately, even a heavy poison coating on foliage and fruit throughout the period of attack does not insure complete protection. However, the heavier and more uniform the spray deposit, the greater are the chances that a hatching larva will swallow a killing dose of poison before getting inside an apple. In testing spray materials the investigator must take pains to produce adequate and uniform coverage. We sometimes hear the remark, "Oh, well, those are experimental results. You can't expect me to throw spray material around like that. I have to pay for it." To the contrary, the grower usually pays more for his packed apples when he attempts to save on spray materials, and the codling moth remains one of his chief problems year after year. We can sympathize with him, but can do nothing to help him.

Considerable controversy surrounds this matter of thoroughness. It deals with amounts per tree, pressure and volume, nozzle clusters versus spray guns, and operators on the ground, tank, or tower. Opinions are formed by experience and sometimes in spite of it, and various styles of operation have their appeal. But always the object should be kept in mind, and should never be sacrificed for speed or cheapness. Careful examination of a few trees will tell. If the view outward and upward from the trunk reveals less spray material than the view from the outside, put the spray guns under there. If a climb into the tops shows that they are not at least as well coated as the lower parts, do not hesitate to correct this mistake, for it is a fatal one. The tops are harder to spray, more subject to weathering, and more heavily attacked by the codling moth than the lower parts of the trees, and should receive the larger share of attention in spraying.

If trees are of medium size and well opened up by pruning, so that all parts can be reached by the driving mist from a "broom" of nozzles on top of the tank, by all means take advantage of this method of cutting labor costs. But in another block of taller or denser trees, if examination shows inadequate coverage by this method, be quick to put a man on the tank or tower and one or two on the ground, and allow more time for the job. Do not be wedded to a system, but adapt the system to the needs of each particular block of trees; and let the choice of the system and of the amounts of spray be guided by careful examination of the results. All of us have seen too many wormy apples on trees that from the outside appeared to be plastered with spray.

On the third essential, choice of proper materials, the grower is at the mercy of the investigator and of the salesman, and more recently, of the Food and Drug Administration. Lead arsenate, the old "standby," is under heavy fire in every section where the codling moth problem is acute. By the investigator it is no longer considered to be an ideal insecticide because of its lack of contact effect and the consequent need of frequent and heavy applications to maintain an adequate poison coating on the

growing apples, and also because of injuries to foliage and fruit that sometimes develop when it is used continuously or in combination with other spray materials. The Food and Drug Administration, concerned with the public health, questions its use in such large amounts on apples and other products intended for human consumption. The insecticide manufacturer, seeking to develop a product to take its place, is sometimes too eager to push his substitute material.

In spite of this barrage of criticism, and granting that a better material is greatly to be desired and may conceivably be produced in the not too far distant future, lead arsenate remains to date the most widely used insecticide for codling moth control, for reasons that we all appreciate. Investigations in Pennsylvania have as yet produced no change in the standard recommendation of three pounds of lead arsenate per hundred gallons, plus liquid lime sulphur when a fungicide is required. This recommendation, as applied in the petal-fall and an adequate number of cover sprays, has helped to accomplish a gratifying reduction of codling moth damage. Records from our Adams County experimental plots, as presented in Table 1, show a steady reduction in the worm population except in 1933, when fear of lead residues forced an early abandonment of spraying with lead arsenate.

Table 1. Trend of Codling Moth Population and Damage in Plots Sprayed With Lead Arsenate

Adams County, Pa. 1931-1935

Variety	Year	No. Cover Sprays	Lead Arsen. Total Lbs.	Apples Per Tree	Per Cent. Injured	Worms Per Tree	Grains Per Lb. at Harvest (Pb) Lead	Grains Per Lb. at Harvest (As_2O_3) Arsenic Trioxide
Grimes	1931	4	12	719	93.4	751	.....	.017
"	1932	5	14	2359	32.9	243	.....	.025
"	1933	3	6	695	94.3	1092	.005	.002
"	1934	6	18	2510	28.0	144	.030	.014
"	1935	5	15	106	38.3	14	.051	.....
Rome	1932	5	15	3101	15.7	132	.....	.006
"	1933	3	7	840	80.5	589	.011	.002
"	1934	8	24	2380	25.8	39	.096	.036
"	1935	5	15	943	14.8	17	.059	.....

Comparison of the years 1933 and 1935 indicates the value of heavy spraying in a light crop year. This is not generally practiced, but is one of the best ways of reducing a heavy codling moth population. The records also suggest that for 1936 four cover sprays ending in early July may suffice. Because washers have now been installed in most packing houses it is possible to apply five or six sprays ending in early August,

and remove the resulting residues by a one-minute exposure to cold 1.5 per cent. hydrochloric acid in a flotation washer. Incidentally, the results of washing experiments in Maryland, reported by Dr. Beaumont and Dr. Haller, closely parallel our own.

Many attempts have been made to improve the spreading and sticking qualities of lead arsenate. In Pennsylvania mineral oil sprays have not been tried for this purpose because of their danger following sulphur. As shown in Table 2 the addition of choice light-pressed menhaden fish oil at one quart per hundred gallons has given the greatest benefit. Skim milk powder at two pounds per hundred gallons has been somewhat less effective. Tests in 1932 with a brand of lead arsenate containing casein, to which three pounds per hundred gallons of hydrated lime was added in the tank, showed a distinct increase in codling moth damage, but in 1934, when the lime was reduced to one-half pound per hundred gallons, results were equal to standard lead arsenate plus skim milk. The use of these materials has not increased the safety of the lead arsenate-lime sulphur combination appreciably, and their addition to the spray mixture is not justified except in heavy codling moth infestations.

Table 2. Per Cent. Wormy Fruit, as Affected by Certain Spreaders and Stickers

		Lead arsenate, 3 lbs. per 100 gals., plus		
	No sticker	Fish oil, 1 qt.—100	Skim milk 2 lbs.—100	Casein and hyd. lime
1932.....	6.9%	5.1%	.....	21.3%
1932.....	11.8%	4.1%	.....	15.8%
1933*.....	3.0%	0.9%	1.4%	.....
1934.....	4.9%	1.7%	3.7%	3.6%

*First brood counts only.

The testing of calcium arsenate for codling moth control in Pennsylvania has been limited. Its use has been accompanied by an increase in worminess and in the amount of arsenical injury to foliage and fruit. It has not been used with Bordeaux Mixture. This fungicide appears to reduce the effectiveness of lead arsenate. In 1935 lead arsenate plus Bordeaux (2-6-50) gave 19 per cent. wormy fruit, while lead arsenate plus liquid lime sulphur gave 9.5 per cent. wormy fruit on adjacent trees.

High stomach poison value is essential in the first few sprays, for all worms that escape produce moths later in the season, with resulting heavy attack from late larvae and a large carry-over into the next season. Therefore lead arsenate must be retained until a satisfactory substitute appears, even though its use after the first cover spray may necessitate washing the fruit. Among the proposed substitutes nicotine, at present of less stomach poison value in the field, offers the most promise. Tests in 1935 were distinctly promising, and some results pertinent to this discussion are given in Table 3. They are not the basis for recommendation to growers

at this time, but are of interest as showing how further development of fixed nicotine compounds (of which 155A and 155B are examples) continues to narrow the gap between these materials and lead arsenate.

Notice first that greater freedom from total codling moth injury (both worms and stings) was obtained with fixed nicotine after the first cover spray than with the schedules employing lead arsenate for the first brood, and that this result was accomplished with less injury to foliage and fruit and no washing problem. Notice in contrast that the greatest reduction in worm population was obtained by using lead arsenate throughout, even though the schedule stopped with five applications as against eight with the other materials. In worminess three sprays of lead arsenate, followed by five of fixed nicotine and summer oil, gave results slightly inferior to five sprays of lead arsenate, with increased spray injury to Grimes. This was produced largely by using oil just twenty days after sulphur.

Table 3. Lead Arsenate vs. Substitutes for Codling Moth Control

Adams County, Pennsylvania. 1935

Spray schedules (amounts per 100 gals.)

Lead arsenate—3 lbs., plus lime sulphur—2 gals., on May 28, followed by treatments

	1		3		6	
	Lead arsen—3 lbs. Fish oil—1 qt. June 7* June 18 June 27* July 27		Lead arsen—3 lbs. Fish oil—1 qt. June 7* June 18 155A—6 lbs. Orthol—K, 3 qts. June 27†-July 9 July 19-July 30 Aug. 9		155B—6 lbs. June 7* June 18 June 27* July 9 July 19 July 30 Aug. 9	
Counts of drop and picked fruit.	Grimes	Rome	Grimes	Rome	Grimes	Rome
Per cent. clean.....	62	85	60	84	68	91
Worms per 100 apples	14	1.8	17	2.6	27	3.0
Per cent. russeted	37	5.6	49	5.6	20	2.0
Lead at harvest Gr/lb.	.051	.059	.030	.027	.012	.008

*Plus 5 lbs. flotation sulphur. †Plus 2 lbs. Coposil.

Considering the present status of the codling moth in Pennsylvania, further study is planned of the combination of lead arsenate with a fixed nicotine that requires no mineral oil, in a schedule of four first brood

sprays at approximately 10-day intervals. If worminess is further reduced by adding the stomach poison effect of nicotine to that of lead arsenate, and the percentage of clean fruit raised through the ovicidal action of nicotine, it should become unnecessary to spray for codling moth in most Pennsylvania orchards later than early July.

The second line of attack, which consists of scraping and banding the trees with chemically-treated bands, has proved to be a most valuable addition to spraying in heavily infested orchards. This supplementary control method is now generally practiced in the "codling moth belt" of Pennsylvania, but is considered to be an emergency measure, the importance of which will decrease as the codling moth problem becomes less acute. However, it is not clear how soon banding should be discontinued. One grower claims such marked benefit that he will continue to band as long as he gets an average of six or more worms per tree.

The results of banding investigations in Pennsylvania will probably be published in bulletin form this winter, but it may be of interest to mention here a few of the important considerations without producing the experimental evidence.

Well over 90 per cent. of the codling moth larvae normally cocoon upon the trees, seeking shelter beneath the rough bark on the trunk and heavy limbs, and in cankers, pruning scars and split limbs in the upper parts of the trees.

Reducing the natural shelter by scraping off all rough bark does not drive the mature larvae into the upper parts of the trees, but serves to concentrate them in a corrugated strawboard band fitted tightly about the trunk. Up to 95 per cent. of the larvae have been thus trapped.

The chief purpose of banding is to reduce summer moth emergence and the following attack of second brood larvae. Because many of the early worms, that always pupate the same season, are satisfied with slight shelter for their cocoons, it is important to prune out as much of the injured wood as possible, in addition to scraping the bark. Otherwise many larvae may escape the bands.

Well-prepared bands of kraft-faced corrugated strawboard should have few clogged tunnels, and should weigh at least 11 pounds per 250-foot roll of 2-inch band; 5 pounds of band and 6 pounds of the impregnating mixture of betanaphthol and oil.

Bands should be freshly prepared, and should be applied in June, just before the first mature larvae are expected to leave the apples in search of cocooning quarters.

Bands should be fitted snugly to all depressions in the trunk. Staples slightly wider than the band are better than tacks for this purpose, and

they should not be pounded down too tight, or swelling of the trunk will flatten or split the band.

Except on trees difficult to scrape or prune, proper betanaphthol bands should trap 80 to 90 per cent. of all larvae that escape the spraying and natural enemies, and should prevent 75 to 85 per cent. of the normal attack of second brood worms.

In an average mature orchard, costs for scraping and banding now run about 13 cents per tree, divided about three-fourths for labor and one-fourth for materials. Considering the results, the expenditure is amply justified where the codling moth is a problem.

Much of this discussion may seem like an old story. But please be indulgent, and consider that for his own protection the investigator must join the Extension teacher in his plea for proper methods. For if recommendations based upon the results of field research are to work in the hands of the grower, he must do his work with equal or greater thoroughness than the investigator. In conclusion let me state what you may already have guessed. In its fight against the codling moth in 1936 Pennsylvania will place chief reliance upon spraying with lead arsenate and the use of chemically-treated bands. Portion of the research program will be devoted to study of spray combinations that offer the hope of increased codling moth control with lessened danger of spray injury and spray residues.

THE CODLING MOTH IN 1935 AND 1936

By E. N. CORY
State Entomologist, College Park, Maryland

Annually, the Department of Entomology and the Department of Plant Pathology conduct an orchard survey to ascertain the status of the codling moth and other insects, and the principal plant diseases. The survey this year was largely made by Messrs. Graham, Crosthwait, and McConnell and serves to give us a picture of conditions in general and gives us exact information on the pest status in individual orchards forming a part of this general mosaic.

The codling moth is at a very low ebb in some of the orchards that have had sufficient funds to equip their orchards adequately and to maintain sufficient labor to carry on the work. In other orchards where the reverse is true in regard to labor and equipment the situation is decidedly serious.

Cold night temperatures at the time of the normal emergence of the codling moth retarded the egg laying of the first-brood codling moth approximately two weeks so that by the time the maximum egg deposit was reached a thorough arsenical coverage was on the fruit and foliage waiting for the first meal of the newly hatched codling moth larvae. Owing to

this delayed hatch it became necessary to introduce an additional cover spray between the third and fourth cover sprays. Orchardists who were able to apply this additional spray at the proper time and who have been able to handle their spraying operations on an adequate basis are now in a splendid position for next season's work.

Our survey of 22 orchards in Western Maryland may be divided into two groups, one of 14 orchards, two varieties to the orchard, that showed remarkably high control in most cases. The average for this group was 94.5 per cent. fruit free of insect injury. This, of course, does not mean that the orchards produced perfect fruit to that extent because no account was taken in these figures of disease percentages or the amount of spray injury. In this same group of orchards the codling moth was reduced to 1.6 per cent. worms and 2.53 per cent. stings, with .9 per cent. scale present as the average of fourteen orchards, although only seven orchards showed actual scale injury. The other eight orchards, mainly through lack of equipment, were unable to secure such excellent results. The average of this group was 79.7 per cent. fruit free from insect injury, 6.3 per cent. worms, 7.34 per cent. stings, and 6.21 per cent. scale. The last average is very high because several orchards in this group showed an excessive percentage of scale, indicating the need for very thorough scale control during the ensuing winter. The general average for Western Maryland showed 87.1 per cent. worm-free fruit, 3.97 per cent. wormy fruit, 4.94 per cent. stings and 3.5 per cent. scale injury.

The picture in Central Maryland for six orchards is not nearly so favorable. Very few orchards attained the high degree of insect control that was obtained in the far western orchards and an average of 82.69 per cent. worm-free fruit, with 6.77 per cent. worm injury, 9.69 per cent. stung fruit, and .89 per cent. scale injury. In this group individual orchards ran up as high as 25 per cent. worm injury.

The Eastern Shore orchards, of which 18 were sampled, have been divided into a group of 13 showing very satisfactory codling moth control and a group of 5 of which the exact reverse is true. Two orchards in the upper bracket showed a heavy scale infestation, which brought down the average considerably. Those orchards which were adequately equipped and properly manned were able to secure just as satisfactory results in codling moth control as the best orchards in Western Maryland. Those in the upper bracket have amply demonstrated that the codling moth can be controlled almost completely by thorough going and timely work.

The general average for this group is 91.17 per cent. fruit free of worm injury with 1.48 per cent. worms, 3.75 per cent. stung fruit and 1.94 per cent. scale. The latter is accounted for by a very high infestation in two orchards, although only four orchards of the thirteen showed any scale infestation.

The five other orchards in the Eastern Shore survey show conditions just about as bad as it is possible for them to be. As much as 40 per cent. wormy fruit was recorded in one and in another 33 per cent. The average worm-free fruit from this group is 49.6 per cent., with 20.3 per cent. worms, 16.4 per cent. stings, and 2.28 per cent. scale. In partial explanation of the high worm injury, it must be noted that two orchards of this group were struck by hail. However, the highest codling moth injury was not in the hailstruck orchards, but undoubtedly hail accounts for a considerable increase in the average.

The average codling moth injury in the state as a whole from 46 orchards sampled was 7.28 per cent. wormy fruit, 8.23 per cent. stung fruit, 2.04 per cent. scale, and the general average of insect free fruit was 80.47 per cent. In compiling these averages of insect free fruit, other factors of minor importance, such as aphis, curculio, etc., were also included.

The points upon which I wish to lay stress are that the codling moth in these orchards that are adequately equipped is at the lowest ebb, that such a low incidence offers a magnificient opportunity to growers to maintain a higher percentage of worm free fruit by thorough work during the coming season, and the few orchards where a very high percentage of worms occur, offers a challenge to those growers which may determine their success in the future. When any insect is at a low ebb, that is the time when control measures will be most successful. Therefore, it behooves every grower to utilize every means available in the coming season to further reduce the codling moth population.

No general recommendation can be made with respect to the exact program in those orchards having a heavy infestation, but each will be handled as a separate unit. However, there are some few points that stand out that can be treated in a general way. All orchards having scale must undertake thorough dormant or delayed dormant sprays for scale control. Trees must be scraped this year much more thoroughly than heretofore in the preparation for the use of chemically treated bands, applied prior to June 15. Packing houses must be cleaned up and screened where practicable and those orchards that had a heavy crop, necessitating the use of props, should have all props removed to a considerable distance from the orchard or such material should be used for fire wood. Lastly, an intensive spraying campaign should be prosecuted during the coming year.

For twenty-five years I have been urging thoroughness in orchard spraying. Just why a group of intelligent men have to be told the same thing year after year is beyond my comprehension.

Every speaker on pest control that you have had before you, as long as I can remember, whether he was from New York, Illinois, Pennsylvania, or our own State, has emphasized the need of thoroughness in making

adequate coverage of spray material. A large part of the time of our specialists on pest control is devoted to pointing out the need for correction of some ineffective spray practices. There is no short cut that is safe, and I sincerely hope, though I have little expectation that it will be so, that no speaker on your next year's program will have to reiterate the necessity for thoroughness.

PRESENT STATUS OF THE ROSY APPLE APHID AND ITS CONTROL

By W. S. HOUGH

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Four general outbreaks of the rosy apple aphid have occurred in the past fifteen years (1921 to 1935, inclusive) in the orchards of Virginia and neighboring States. The outbreaks occurred in 1922, 1923, 1930 and 1933. During the other eleven years of this period the insect caused little or no damage in most orchards. Here and there, however, it has caused serious losses in other years than those just mentioned.

The nature of the damage done by the rosy aphid is well known to all orchardists. Suffice it is to say that apples injured by this pest are not even desirable for the cider grade.

The rosy apple aphid is one of three species of aphids found on the apple buds in late March or early April. The two green species (the apple-grain aphid and the green apple aphid) are more abundant on the buds and for this reason are more easily seen. The rosy aphid, on the other hand, is usually much less abundant and because of this fact is usually overlooked by growers, even in years when a general outbreak follows. One cannot conclude from the abundance of young aphids on the buds in the Spring of the year what the indications may be for an outbreak of the rosy aphid.

The rosy aphid injects certain juices into the leaves which causes the leaves to curl and thus perfect protection is provided against contact sprays. For this reason, no spray or dust applied after the leaves have curled gives adequate control. The first generation is not sufficiently numerous to attract the grower's attention until the leaves begin to curl, which usually occurs about the time the first leaves are an inch long or immediately following the delayed dormant period. The second generation is more numerous and is at work when the calyx spray is applied. Because of the alarming increase in the numbers of curled leaves, growers sometimes add nicotine sulphate in the calyx spray or even in the "pink" spray, but we have never observed adequate control resulting from this practice. In years when a general outbreak occurs the third generation

is extremely abundant about two to four weeks after the petal-fall stage. It is this generation that causes so much damage to the fruit. The peak of the attack usually occurs about four weeks after the petals have dropped and two weeks later most of the aphids will have migrated from the apple trees to plantain where they spend the summer. From late September through early November a generation of winged aphids fly from the plantain back to the apple trees. The winged female migrants bear wingless individuals, yellow in color, which grow to maturity on the apple leaves and then deposit eggs on the limbs and twigs. Most of the eggs are deposited on the lower branches. Migration and egg laying was observed to be quite general in late October and early November of this year (1935), and for this reason we are led to believe that a general outbreak of the rosy aphid should be expected in the Spring of 1936.

In years when severe outbreaks have occurred (1930 and 1933) growers as well as experimenters have obtained best control by using tar distillate sprays applied in the dormant period against the eggs. Coal-tar oil and water-gas tar oil appear to be about equally effective. In the delayed dormant period excellent control was also obtained with lime sulphur and nicotine sulphate, provided, the application was timely and very thoroughly done. Petroleum oil emulsions with nicotine sulphate or with cresylic acid in the delayed dormant period were less effective than lime sulphur plus nicotine sulphate. The time of applying oil and cresylic acid in the delayed dormant period is limited by the fact that excessive spray injury may occur in the very late delayed dormant period, the injury being due to the caustic action of the cresylic acid on the young leaves. Table 1 shows results obtained with dormant and delayed dormant sprays, all very thoroughly applied, in 1933, when the last general outbreak of the rosy aphid occurred. For satisfactory commercial control there should be not more than five per cent. of "aphis apples" in years of severe infestation.

Generally speaking, growers have not obtained satisfactory control with oil emulsions used alone or with cresylic acid in years when the rosy aphid was abundant; with lime sulphur and nicotine sulphate the results have been quite variable. In years when the rosy aphid infestation was light, the combinations just mentioned have given satisfactory results.

The question may arise, "Why do sprays applied in the delayed dormant period give such variable results in years when the rosy aphid is abundant?" Whenever a breeze is blowing the young aphids are found on the leeward or sheltered side of the buds, and this fact alone greatly increases the difficulty of hitting them with the spray. To be effective the spray must hit the aphid. Because of the presence of nicotine vapors from nicotine sulphate, wetting of the aphid does not have to be as complete when nicotine sulphate is used as when oil is used with or without

cresylic acid. The survival of relatively few rosy aphids in years when the insect is abundant may be sufficient to develop a severe outbreak a few weeks later. In years when the infestation is light or almost completely absent, survival of an occasional individual is not sufficient to cause any important injury later in the season. For example, let us suppose that in a "rosy-aphid year" there are 1,000,000 rosy aphids on the buds of 100 apple trees. Suppose that only 1 per cent. of them survived the delayed dormant spray, which means there would still be 10,000 rosy aphids remaining on the buds of the 100 trees to produce the next generation. But in a year of light infestation there may be only 100 rosy aphids on the 100 trees. Survival of 1 per cent. of this number is only 1 and, of course, one rosy aphid per 100 trees cannot be considered dangerous.

In the dormant period the aphid eggs are found glued to the branches and they cannot migrate to the sheltered side of the twigs as the young aphids do in the delayed dormant period. It is only necessary to use an effective ovicide (tar distillate) in the dormant period, and spray the twigs first on one side and then on the other side as the wind changes, in order to obtain a high percentage of kill.

My experience with effective ovicides against aphid eggs began with a material known as dinitro-ortho-cresol in 1927 and with tar distillates in 1930, and has involved the examination of 54,156 eggs in determining percentage of kill obtained by various treatments. It is sufficient to state that the effective ovicides (coal-tar distillate, water-gas-tar distillate and dinitro-ortho-cresol) are equally efficient, whether applied in late autumn, mid-winter or in early spring before the buds show green tips. Factors governing the time of spraying are dormancy of the trees and weather conditions. Tar distillates are preferable to dinitro-ortho-cresol because the former are cheaper, readily available and less dangerous to humans.

Table 1. Results of Experiments for Control of the Rosy Aphid in 1933
(Dormant sprays applied in March, delayed dormant in April)

Plot No.	Time of Spraying	Materials and Amount Per 100 Gallons	Per cent. of "Aphis Apples"
Funkhouser orchard			
2	Mar. 17	Oil 3¼% and cresylic acid (1-B) 1%	13.7
7	Mar. 17	Oil 3¼% and cresylic acid (dark) 1%	14.0
9	Mar. 17	Coal tar distillate 2.4%	0.0
12	April 10	Oil 3% and cresylic acid (1-B) ½%	2.0
13	April 10	Lime sulphur 5 gal., nicotine sulphate 1 pt	0.6
14	April 10	Oil 3% and cresylic acid (dark) ½%	7.2
15	April 10	Oil 3%	6.3
		Check trees, not sprayed	38.3

Mt. Clifton orchard

1	April 15	Lime sulphur 2½ gal., nicotine sulphate 1 pt.....	3.6
2	April 15	Oil 3% and nicotine sulphate 1 pt.....	10.2
3	April 15	Oil 3% and cresylic acid (1-B) ½ %.....	13.2
4	April 15	Oil 3% and colloidal cresylic acid (dark) ½%..	11.73
5	April 15	Oil 3% and cresylic acid (1-A) ½%.....	12.0
6	April 15	Oil 3% and cresylic acid (S D) ½%.....	18.2
		Check trees, not sprayed.....	81.0

Note: Different grades of cresylic acid used in the above tests are indicated by the notations "1-A", "1-B", "dark", and "S D". Grades commonly used in spraying are "dark" and "1-B".

Specifications of two coal tar distillates (creosote oil) and of two water-gas tar distillates are given below. These tar oils have been very effective in killing aphid eggs when used at the rate of 2½ gallons in making 100 gallons of diluted spray.

Sample No. 1 (Coal tar distillate or creosote oil)
Moisture less than 3%
Specific gravity 1.08

Per cent by weight distilled at	
210°C	0.0
230°C	5.0
270°C	22.0
320°C	55.0
350°C	75.0
360°C	80.0

Crystal free at 5°C

Sample No. 2 (Coal tar distillate or creosote oil)
Moisture less than 3%
Specific gravity at 38°C 1.10

Per cent by weight distilled at	
210°C	0.0
235°C	5.0
315°C	30.0
355°C	65.0

Crystal free at 5°C

Sample No. 3 (Water gas tar distillate)
Moisture less than 3%
Specific gravity at 20°C 1.042

Per cent by weight distilled at	
210°C	0.0
235°C	0.6
270°C	25.7
315°C	79.5
355°C	95.9

Crystal free at 5°C

Sample No. 4 (Water gas tar distillate)
Moisture 1.5%
Specific gravity at 20°C 1.025

Per cent. by weight distilled at	
210°C	1.8
235°C	13.6
315°C	81.6
355°C	92.4

Crystal free at 5°C

THE USE OF COPPER SPRAYS IN THE APPLE ORCHARD

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Fungicides for use in the apple orchard can be roughly classified into the sulfur and copper groups. Lime sulfur and Bordeaux mixture are no doubt the two best known representatives of these classes respectively. Because of the severe copper injury so often obtained from Bordeaux, lime sulfur, from the time of its introduction, has largely replaced Bordeaux mixture. But there have been trends from the one to the other, especially in some localities, ever since.

Copper must be used to control some fungi. From conversation here, I gather that orchardists in this general territory have a drastic need of a safe copper spray program. Although sulfur has drawbacks and copper has advantages it is with some trepidation that I undertake to discuss such an intangible subject.

Now, you should bear in mind that what I have to say is based on investigations in the Hudson Valley and observations elsewhere in more northern regions and need not apply in any way to your conditions. Indeed the whole set-up here is different from that of New York. But it is hoped that my comments may serve as food for thought. While some of my statements may be generally applicable to Maryland conditions, I would advise that you consult your own experiment station staff before adopting them for practice.

Since conditions in Maryland and the neighboring States may be widely variant to New York State, it is perhaps best that I give you some conception of the spray program there and let you make your own deductions. First, let us compare the seasons as to host and parasite developments and pest problems. Apple bloom in the Hudson Valley comes generally in the middle of May, and in Western New York the latter part of May; here in Maryland it is the first week of May. The bulk of the scab spores are discharged between the pink stage and the first cover spray (middle of June) in the Hudson Valley; between the delayed dormant and petal fall spray (middle of June latest) in Western New York; and as I understand it, between the delayed dormant and shortly after petal fall (last of May and first of June about the end) in Maryland. I believe that you have three full broods of codling moth here, whereas we have about one and a half in the Hudson Valley and two and a half in Western New York. It is rarely necessary to spray apples after mid-July in the Hudson Valley, but codling moth sprays are required at two-week intervals from the middle of June to the middle of August in Western New York. It is apparent from these comparisons that there is little spraying in the Hudson

Valley during very high temperatures and what is done is not of necessity heavy enough to cause spray injury. Western New York is more like Maryland in that codling moth control demands repeated heavy drenchings during the season of hot weather periods. And in addition Maryland has diseases such as apple blotch and bitter rot that may demand late spraying, to say nothing of a copper material.

In the Hudson Valley we attempt to avoid spray injury by promoting more effective cultural practices, better spray machinery and diversification in the selection and use of spray materials. We believe that the tree must have maximum root development to take care of the top under adverse conditions. A vigorous tree will be less susceptible to spray injury and can withstand better the appreciable damaging effect of repeated heavy coverages of toxic spray materials. The tree must be well pruned not only to make it possible to drift the spray in without force and consequent injury, but to permit rapid drying so as to shorten the infection periods, to say nothing of savings in spray material and labor costs, ease of picking and better colored fruit. So it is, that good air and soil drainage with good sub-soil conditions go hand in hand with good pruning, fertilizing and other cultural practices in preparing the most fundamental ideal set-up to compete against pests and spray injury.

Of paramount importance along with the well-grown tree is good spraying equipment. Modern spraying equipment will not only enable the operator to obtain better disease control by more thorough and rapid coverage, but will make possible spray applications with a minimum of injury. A fine abundant mist, yet with volume and force enough back of it to drift it through the foliage, is a primary necessity. The commercial apple orchard should be equipped so that it can be sprayed in at least three days so as to have allowance for unfavorable weather, breakdowns, etc. The value of a sprayer lies in the fact that it will work when needed and that coverage can be made to advantage and within the vital period. A proper-sized sprayer is not only a factor in timeliness or effective spraying, but can save labor and materials. Weather conditions, kind of pruning, whether or not the trees are sprayed inside and out, amount of growth, equipment used and most of all the skill of the operator, determine the amount of spray to be used per tree. At least 4, 8, 10 to 12, and 15 to 20 gallons of spray should be allowed for the average 8, 12, 15 to 18 and over 18-year-old trees in full foliage, respectively. Where there is a severe infestation of any pest, such as codling moth, it can be roughly stated that one gallon of spray is required for each bushel of fruit.

Diversification in the selection and use of spray materials is dependent on many pertinent considerations. In reality all such factors as the rate of host development, whether or not the sprays are applied before or after infection periods, the necessity for spraying during bloom, scab on the foliage and fruit, insect problems, host susceptibility to fungus and injury,

weather conditions such as prolonged rain periods, poor drying conditions and high temperatures, the residue problem, and equipment, must receive consideration before we can determine the fungicide to be used to best advantage.

Let us consider the spray schedule in perspective. Apple scab is caused by a fungus that establishes infections on foliage and fruit quickly with suitable wetting periods; that is to say, if there is considerable carry-over of scab from the previous year and the spores are quite mature, approximately 10 to 15 hours of wetting under average conditions may result in considerable scab. Naturally the less carry-over of scab the less important the timing of sprays becomes and, further, good pruning and air drainage materially shorten the wetting periods. Since there is no telling when or how long it is going to rain wouldn't it, then, seem logical that the best practice possible is to protect the foliage ahead of time? Doesn't it follow that more sprays are required during periods of rapid host development? Isn't it good insurance especially when milder or less caustic materials are used to reduce injury, to apply an additional spray or two even of a weak concentration rather than run the risk of having unprotected foliage during the critical spring period? Wouldn't it be advisable to spray during bloom if the last pink spray had been an early one or the variety a long blooming one? One spray more or less sometimes means the difference between success and failure. And after all, isn't spraying for scab largely a question of insurance and isn't the main aim to have little or no scab at the time when the fungus is done shooting spores so that a summer fungicide won't be needed?

Might it not be that the better of our fungicides each has its own place of advantage in the spray schedule? That is, lime surfur is the safest to use during periods of rapid growth as in the pre-bloom sprays and should be used where it is of insecticidal value as for red mite. It is, of course, the only material to use to control scab after infection periods of from about 12 to 48 hours or so. Lime sulfur would no doubt be the safest material to use if scab appeared in any quantity on the foliage or fruit.

On the other hand the use of wettable sulfurs may give materially less injury and be very effective against scab if properly applied. They do not burn out scab but will hold a moderate amount of scab under control. Wettable sulfurs are safest to use during bloom and certainly safer than lime sulfur to apply with calcium arsenate if it can be used. Wettable sulfur plus lead arsenate gives better control of leaf roller than the same arsenical with lime sulfur. The finer flotation sulfurs are perhaps best to use until the fruit takes on size and then the coarser sulfurs such as Magnetic-Spray can be employed for the summer sprays. Coarser sulfurs tend to minimize cheek scald during high temperatures. Wettable sulfurs that contain bentonite may be slightly less effective against scab than the others and are conducive to arsenical injury but, on the other hand, they

are ideal to use just before rains or during drizzly types of rain when drying conditions are doubtful and there isn't time for "setting." Dusting may be a good supplementary measure against scab. Copper sprays too have their place. They are essential for the control of certain fungi and as a fungicide to use with oil and are fairly satisfactory to use at high temperatures to avoid not only foliage injury but cheek scald of the apple.

We have found in the Hudson Valley that it is most economical and most satisfactory to divide the orchard up according to its problems and spray it on that basis. Scab control is a lot more difficult to accomplish on some varieties than on others. Varieties vary a good deal as to their susceptibility to injury. Locations vary considerably as to the use of scab control and danger from injury. Injury is reduced somewhat by alterating the lime sulfur and wettable sulfur sprays, at the same time using each one when it will do most good. Drifting the lime sulfur on for hasty coverage, and finishing up the inside of the trees with wettable sulfurs later, if necessary, has proved to be a good practice. Our growers are making every effort to have effective spray machinery and to apply the sprays without injuring the foliage and fruit.

From this brief discussion, I suppose that it is evident that we prefer to use sulfur in the Hudson Valley. The crucial control period with apple scab there, is usually during the relatively cool period of spraying and early summer. At this season the use of copper materials is limited to the one or two earliest sprays because of lack of host tolerance or russeting. It is usually conceded that copper sprays cannot be applied to apple trees with safety during the period from exposure of blossom clusters until about two weeks to a month after petal fall, depending, of course, on the variety. Scab control must be accomplished at this time in the season. Hence, there would seem to be little excuse for use of copper materials in the Hudson Valley area, particularly since there are no fungi that sulfur will not control.

Generally speaking, copper sprays are preferable to sulfur sprays at high temperatures, but even they should not be used after the temperature gets up in the nineties too far. It is true, however, that sulfur is unlike copper in that if it is present on the foliage at any time when the temperature reaches 100°F., there is likely to be injury, especially if the foliage and fruit have been predisposed by gun or other type of injury. The grower who is faced with the necessity of applying a fungicide to his apples under conditions of high temperature has two alternatives. First, he can risk some russet, or even leaf-drop from the non-vigorous trees, with a copper spray. Second, he can risk cheek scald or foliage injury with sulfur, or even fruit-drop with lime sulfur.

To anticipate a possible demand for a fungicide other than sulfur, and to take care of other eventualities, a certain amount of investigation with copper materials has been carried on in the Hudson Valley. In 1930 Bor-

deaux mixture 3-10-100 was used in all the sprays, but particularly in the pre-blossom sprays on McIntosh and Rome Beauty, with little or no apparent injury. Since these two varieties were considered our most resistent varieties to copper, and because of the general fear of copper that prevailed, further tests were not made until 1933. In this season Bordeaux and Coposil, each 3-6-100, were tested on Baldwin, our most susceptible variety to russet. Coposil gave no appreciable injury to Baldwin except a slight net work effect on the calyx end of the fruit with the petal fall application. Bordeaux gave severe russetting even a month after bloom.

In 1934 Coposil applied to the same block did not show as great a contrast with the Bordeaux. While the Coposil was distinctly less injurious than Bordeaux, it gave more injury in the calyx spray than it did in 1933, and some injury two weeks later. There was not the spread or consistent difference between it and Bordeaux in the later application a month after petal fall. This was also apparent in other blocks. The manufacturers attributed this increased injury to the fact that Coposil was a poor product that year, coarse and abrasive. Also in 1934 copper phosphate mixture, basic copper sulphate, red copper oxide and copper cyanide were tested. Copper phosphate 4-8-4-100 (copper phosphate, lime, bentonite) gave indication of being as good as or better than Coposil, at least from a russet standpoint, in more limited trials. The other materials listed above did not pass the injury test. Tests made on R. I. Greening, Baldwin, Winter Banana, Ben Davis, and McIntosh, except perhaps the latter, showed that not even the most promising copper materials were safe to use before a month after petal fall. Coposil and copper phosphate mixture slightly russeted Ben Davis when applied two weeks after petal fall, but McIntsoh fruits on grafts in the same trees showed perfect finish. Bordeaux 3-6-100 caused severe russeting to the Ben Davis. Oil, either mineral or vegetable, appeared to reduce injury from Coposil and Bordeaux.

During the season of 1935 Bordeaux, Coposil, copper phosphate mixture, basic copper sulphate and copper oxychloride, each 2-4-100 with the latter three with Wyo-gel Z-100, were tested on Baldwin in the pink; 10 to 12 days after petal fall; and 23 days after petal fall; and on McIntosh in the pink; and two weeks after petal fall. Kutane 3-100, Oxo-Bordo 4-3-100, and Cuprocide ½-2-100, with and without oil, were also tried in a limited way. Curiously enough none of the above materials injured the Baldwins in the pink but they did the McIntosh trees which were apparently unusually susceptible to injury. Kutane and Cuprocide were absolutely out of the question as a pink spray on McIntosh. Coposil gave practically no russet. Copper phosphate was almost as good as the Coposil with only a trace of russet even at 3-100 while copper oxychloride gave complete russet at 4-100. Bordeaux and Oxo-Bordo were not widely variant and not much worse than Coposil. Basic copper sulphate gave quite some russet.

In the spray two weeks after bloom in McIntosh, Kutane, Oxo-Bordo,

Bordeaux, Cuprocide, and basic copper sulphate, gave almost complete russet with perhaps some advantage for the Bordeaux. Coposil gave a mere trace of injury. Copper phosphate was considerably worse but not too bad, while copper oxychloride gave quite some russet and was probably out. Ortho K medium summer oil did not decrease the injury of any of these materials and appeared to increase it. For example, it increased the copper phosphate injury to spoil the grade or make its results comparable to copper oxychloride.

The Coposil, copper phosphate mixture, copper oxychloride basic copper sulphate and Bordeaux gave about the same amount of injury on Baldwin whether applied 10 to 12 days or 23 days after petal fall. On an imaginary standard with zero at perfect and 10 as complete russet, these materials might roughly be rated on injury 1, 3, 4, 6-7, and 8, respectively. Oil gave the same results as on the McIntosh. This apparent increase of injury from the use of oil was also evident in western New York when used with Bordeaux. Oil is not recommended for use in the Hudson Valley even in mid-June (apples one-half inch to 1 inch in diameter) because of residue problem.

Coposil is apparently the only available commercial substitute for Bordeaux that can be suggested from Hudson Valley Investigations. Although it is expensive it does give fine finish of fruit and no foliage injury has been observed. However, it may be said that the degree of injury from copper reflected in the final product, the fruit, may be determined in a measure by the amount of thinning done. Apples that get size and color, mask injury. While the apples receiving copper phosphate, copper oxychloride and basic copper sulphate were salable after thinning it is questionable if these materials should be used where there is indication of a light crop unless other fungi make it imperative or, perhaps, in cases when the lime is to be replenished by repeated applications to take care of the free copper.

In all fairness to these latter materials let us consider two other factors that may play a part in injury, that of adhesiveness and copper content. Bordeaux, Coposil, copper oxychloride, copper phosphate and basic copper sulphate were all used at 2-100 but actually contain 25, 15, 24, 44, and 52 per cent. copper, respectively. The data, which need not be considered conclusive, indicate that Bordeaux because of its peculiar physical properties leaves an initial residue on the foliage almost as great as the materials with twice the copper content and double that of Coposil. Bordeaux 1-2-100 is apparently equivalent to Coposil 6-12-100 on a residual protective basis. Coposil 2-4-100 is approximate to copper oxychloride 1-2-100, copper phosphate ½-1-100 and basic copper sulphate ¾-1½-100 on the same basis. These analyses would seem to indicate that any reduction in the amount of injury caused by these materials, particularly Coposil, may in part be tied up with lack of adhesiveness. Poor adhesiveness seems to be an in-

herent characteristic of practically all the substitutes for Bordeaux. The dry forms of copper are not unlike the dry flotation sulfur in this respect. Paste materials appear to be inherently more adhesive especially under adverse conditions. Of course, it is because of lack of adhesiveness that Wyo-Gel or bentonite is added to these materials, and there is rumor that it may play a part in making these materials more injurious or less effective. Dr. Goldsworthy tells me that injury and lack of effectiveness as a fungicide at least for the copper phosphate is tied up with the degree of solubility of the material. The Coposil and copper phosphate are least soluble of these materials, give least injury and the copper phosphate particularly has at times shown indication of not controlling scab. The other materials are more readily soluble and are more effective, but give more injury. Oxo-Bordo was not investigated along with these materials except in a small way but with these studies and other observations and reports it would seem to have little or no advantage over Bordeaux as far as injury is concerned and certainly is not as effective in controlling scab.

Now, let us turn for a moment to western New York where the set-up of high temperatures and repeated heavy applications for codling moth is more nearly like that of Maryland. Lime sulfur makes havoc of their orchards in mid-season and, in addition to ruining the foliage, causes heavy fruit drop. Sulfur of any kind frequently may be disastrous. And they use considerable oil for the codling moth control. Their main difficulty seems to be in keeping the scab under control so that at least after the first cover spray they can cease using a fungicide. Repeated applications of lime sulfur in mid-season are thought necessary to keep scab down. Mr. Harmon and Mr. Reed, the entomologists working on codling moth there, tell me that they have experienced no difficulty there in using Bordeaux 2-4-100 as a fungicide for the first 2, 3, or more cover sprays (first one, two weeks after petal fall). From available data there would seem to be no reason why Bordeaux would not hold scab in check as well as lime sulfur. Cherry leaf spot data show clearly that Bordeaux has a longer durability than lime sulfur. One would think that since sprays are applied every two weeks that Bordeaux 1-2-100 would be sufficient strength. And as stated earlier repeated applications of the Bordeaux or lead and lime replaces the lime in the Bordeaux and so may in a measure take care of any free copper formed and keep down injury. Of course residue is not a problem in that the fruit must be washed anyway. Although there may be a little russet the fruit looks good compared to the cheek scald from sulfur or the other types of injury caused by the sulfur.

Copper seems to be very regional in its application. Copper injury in the Hudson Valley seems to be more severe than in western New York Copper injury appears to decrease the farther south one goes, but not consistently. Copper should not be used in humid areas. It gives best results with moderate to high temperatures. As already intimated, it is the carbonation of the lime or its removal by rain that leaves the copper

free, with good drying weather, to be acted on by the plant. Variation in plant water supply, coarse lime in the sprays and improper mixing, lead to trouble. Damaged foliage is always susceptibile to spray injury. Copper materials have the peculiar property of possibly causing little or no injury for 3 or 4 years and then marring the whole crop. And then, again apart from varietal differences, there is a great variation in orchards and individual trees in the same orchard. So much depends on the tree vigor, sub-soil conditions and method of spraying.

In view of the ticklish problem of putting copper in the orchard let me recommend that each grower size up his own situation and proceed carefully preferably in a small way until he is sure of what these copper materials do under his own set-up.

REPORTS OF COMMITTEES

Auditing

Chairman Lloyd Balderston of the Auditing Committee reported that the books of the Treasurer had been found in order. Report accepted by unanimous vote.

Nominating

Chairman E. D. McCain of the Nominating Committee reported the following nominations:

President—C. E. Bryan, Havre de Grace.
First Vice-President—B. Carlisle Barnes, La Plata.
Second Vice-President—G. William Gardenhour, Smithsburg.
Secretary-Treasurer—A. F. Vierheller, College Park.

Executive Committee

W. Lee Allen, Salisbury.
N. C. Graybill, New Windsor.
E. C. Auchter, College Park.
O. R. Higgins, Hurlock.
G. S. L. Carpenter, Hagerstown.
Lloyd Balderston, Colora.
G. Rust Canby, Silver Spring.
R. S. Dillon, Hancock.
Fred R. Sloan, Lonaconing.

Representative to the Maryland Farm Bureau Federation, the Maryland Agricultural Society and the Maryland Agricultural Corporation:

Henry C. Whiteford, Whiteford.

Without discussion it was unanimously voted that the Secretary be instructed to cast the vote for the entire list of nominees.

Resolutions

Chairman W. Lee Allen of the Resolutions Committee read the following resolutions and with only slight individual discussion they were adopted as read:

We, the members of the Maryland State Horticultural Society, fully appreciate the motive of the State Legislature which, in effecting a program of reduced expenditures, made considerable reduction in the appropriations to the Maryland Agricultural Experiment Station and other departments of the University. However, we feel that continued operation of the Experiment Station on this basis will be a serious detriment to the character of research and investigational work which we know is basically essential to the progress and existence of our industry. Therefore, be it

Resolved, That we go on record as favoring restoration at the earliest possible date of appropriations to the University, especially those of the Agricultural Experiment Station for research work on the problems of horticulture.

It is with pleasure that we note the attendance of larger numbers of prominent fruit growers from adjoining States at the meetings of this Society.

Their interest is manifested by faithful attendance at our meetings and by active participation in the discussions. Therefore be it

Resolved, That we assure these growers of a hearty welcome at our meetings always, and invite them to attend again next year, bringing their families and fruit-growing friends with them.

We the members of the Maryland State Horticultural Society note with regret the resignation of Dr. J. H. Beaumont as head of the Department of Horticulture at the University of Maryland.

We not only recognize the loss of a good friend and able adviser, but deplore the inability of the University authorities to hold such a man in and for this State.

Inasmuch as we want to thank Dr. Beaumont and wish him further success, be it

Resolved, That we hereby express our appreciation to him for able and faithful service while he was with us in this State, and be it further

Resolved, That we assure him of our best wishes for continued success and achievement in the new work to which he has gone. Be it further

Resolved, That we send a copy of these resolutions to Dr. Beaumont, to

Acting President Byrd of the University of Maryland, and to Dr. H. J. Patterson, Director of the Experiment Station.

For the best attended meetings this Society has had for many years.

For an unequaled program which would draw and hold this attendance.

For fine educational and commercial exhibits, which add so much to the value of our meetings, thanks are due. Therefore, be it

Resolved, That we hereby express our appreciation to the secretary and program committee for the arrangement of this fine program, to the speakers who have given us the benefit of their researches and experience, to the staffs of the Department of Horticulture, Experiment Station and Extension Service, for educational exhibits and to the commercial exhibitors and advertisers in the Maryland Fruit Grower for their splendid cooperation. And be it further

Resolved, That we commend the action of the Executive Committee in bringing our meetings to Hagerstown this year and recommend the selection of the place for next year which seems to them most likely to result in successful and well-attended meetings.

It has been the will of Divine Providence to take from our midst during 1935 these members of this Horticultural Society:

Col. A. W. Sisk, Preston, Md., a former president of the Society.
C. K. McCaslin, Cockeysville, Md.
Aaron Newcomer, Ringgold, Md.
F. A. Lazenby, Randallstown, Md.

Therefore, be it

Resolved, That we hereby declare our deep sense of loss, both personally and as a Society, at their passing. Be it further

Resolved, That we extend our heartfelt sympathy to the families of these gentlemen. Be it further

Resolved, That a copy of this resolution be sent to each of the families and also be spread upon the minutes to become a part of the permanent records of the Society.

Adjournment.

REPORT

OF THE

Twenty-ninth Annual Meeting

OF THE

Maryland Crop Improvement Association

Baltimore, Maryland

January 15-16, 1936

AND OF THE

STATE CORN SHOW

PROGRAM

Wednesday, January 15, 1936

I. Call to order by the President, Walter Warehime, Westminster, Md.
II. Some Methods of Erosion Control for Maryland—O. C. Bruce, Soil Conservation Service, Hagerstown, Md.
III. Practical Erosion Practices for Maryland Farms—H. E. Klingman, Soil Conservation Service, Hagerstown, Md.
IV. Cropping Systems and Soil Conservation—J. E. Metzger, University of Maryland.
V. Discussion.
VI. Committee Appointments.

Thursday, January 16, 1936

I. Call to order by the President.
II. The Economy of Home Grown Feeds—A. B. Hamilton, University of Maryland.
III. Future Prospects in Agriculture—Everett C. Weitzell, University of Maryland.
IV. New Grains and Hybrids, Dr. W. B. Kemp, University of Maryland.
V. Discussion.
VI. Secretary-Treasurer's Report and Business Meeting.

The present officers of the Crop Improvement Association are:
President—Walter Warehime, Westminster, Md.
Vice-President—Matt Harding, Cambridge, Md.
Secretary-Treasurer—F. W. Oldenburg, College Park, Md.
The State Corn Show and the State Potato Show were held at the Lord Baltimore Hotel in connection with these programs.

SOME METHODS OF EROSION CONTROL FOR MARYLAND

By O. C. BRUCE, Soil Conservation Service
Hagerstown, Maryland

Soil erosion, in the broad sense, means the loss of the valuable surface material as a result of various agencies involved in the transportation of soil material through appreciable distances. In most instances, this process is destructive to soil fertility and in many cases the damage has gone forward to such an extent that it is impracticable to reclaim such impoverished areas. The functions of the Soil Conservation Service is to reduce erosion losses to a minimum in order that the productiveness of our soils may be preserved for future generations.

For practical purposes, wind and water may be considered the principal agencies of erosion. The activity of wind is not considered here since wind erosion is confined to semi-arid and arid regions of the west. In the latter case where the soil is not adequately protected by vegetation, where there is no binding influence of an ample supply of moisture and where there are strong prevailing winds, a set of conditions exists which induces erosion by the wind. As a consequence, the soils of the Atlantic States are not affected by wind erosion because the above conditions do not prevail. This is due to the fact that it is a region of relatively high annual precipitation, and as a consequence, does not favor the conditions which cause destructive wind erosion.

Soil erosion in Maryland is confined almost entirely to that caused by the action of running water. The rapidity with which water erodes soil depends upon a number of factors, the most important of which are the topography, characteristics of the soil, land utilization and the cropping plan. An understanding of the influence of the above factors on soil erosion properly applied in a good system of farm management will do much to reduce the destructive effect of running water.

The movement of water produces two types of erosion, gully erosion and sheet erosion. The former is caused by the accumulation of water in sufficient volume and its consequent flow through a depression at erosive velocity. Such action will ultimately form a gully, from which the type takes its name, and its development results in the removal of a considerable amount of rich topsoil. If the growth of the gully is not checked, a

system of gullies will be formed which will ultimately render the soil unfit for agricultural operations. This is the most striking type of erosion and it is not necessary to call attention to its destructive effect. Sheet erosion is caused by water running over a slope, not in a depression, and removing a uniform thin layer of soil from the surface. This action is not rapid. It may occur so gradually that the farm owner does not notice that erosion is active. As a consequence, many farmers are farming the subsoil and are not aware of the fact. An examination of the soil in a wooded area of the vicinity is usually sufficient to confirm the truth of the latter statement. While sheet erosion is not rapid, its continued activity will deplete the fertility of the soil to such an extent that farming is no longer profitable. Therefore, both gully and sheet erosion are destroyers of our agricultural lands as well as our national wealth and the evil effects of each should be reduced to a minimum.

The Soil Conservation Service believes that its objective is to preserve in the most practical manner the fertility of soils that are still productive. Such a procedure does not include the restoration, to its former productive basis, of land which has already been destroyed by erosion. In addition to being too expensive, there is too much valuable land to be saved to adopt the latter plan. Consequently, the erosion program for Maryland is designed to assist the farmer in saving land which is still productive from the destructive influence of soil erosion.

The methods employed by the Soil Conservation Service for controlling soil erosion are vegetative and mechanical or a combination of the two systems. The use of the vegetative plan involves proper land utilization and a planned cropping system including the arrangement of plantings and the selection of plants adapted to the area which have the maximum binding effect on the soil. The mechanical means of erosion control include the construction of terraces and terrace outlets, check dams, diversion ditches and other related structures. The use of vegetation in controlling erosion will probably be used most in Maryland. Regardless of the method used, no set plan can be established which will be applicable to all conditions. Each farm is a distinct problem in itself and it is therefore necessary to work out a plan which meets the existing conditions and the requirements of the farmer.

Terracing in Maryland has been done on a comparatively small scale. Some few orchards in the western part of the State have been terraced and, on the whole, the results have been favorable. It is expected that a few farms will be terraced as a means of demonstrating their value as an erosion control measure. This should serve as an interesting and valuable demonstration since there is little or no available data pertaining to terracing in the State. Additional terracing other than for demonstrational purposes, will be done only at the request of farmers who sign cooperative agreements.

Securing cooperators for the erosion control program in this section (on Project Md-1) is done in cooperation with the Extension Service. Meetings are called by the County Agent, on a suitable date, at a place which is accessible to the greatest number of farmers. The date and place of meeting is advertised through the medium of local papers, posters and the mails in order that as large attendance as possible may be had. The erosion control program is fully explained at the meeting and invitation cards passed out to interested farmers.

Those who sign and mail the invitation cards to the office of the Soil Conservation Service are not incurring any obligation, they are merely inviting representatives of the Service to visit them with the view of working out a suitable program for their entire farm. The soil and land use maps are prepared before deciding upon a definite policy. The farmer is not urged or asked to agree upon a program which is not satisfactory to him and which will not meet his requirements. Upon the completion of a satisfactory plan, the cooperative agreement is signed between the farmer and the Soil Conservation Service. The plan agreed upon is to be followed for a period of five years. It is now possible to begin the necessary work towards applying the principles of the erosion control program. No work of any character may be done on farms without a signed cooperative agreement.

CROPPING SYSTEMS AND SOIL CONSERVATION

By G. E. METZGER

Professor of Agromony
University of Maryland

A cropping system is a series or succession of crops grown in a prescribed order or rotation. It implies that the arrangement of the fields of the farm are such that a rather uniform volume of each crop may be produced each year. In the farm layout it is not always necessary to have fields of equal acreage. In fact the land division, that is, the size of the fields, should be made on the basis of production capacity. This may mean a revision of the layout at times, as poorer fields are improved in their fertility.

There is no evidence that any well defined system of crop rotation was practiced in this State before about 1890. In fact there is every evidence that the selection of a field for corn or fallow wheat was made on the basis of the success or failure of a hay crop. Farmers in those days, and in fact in some instances at the present time, objected to plowing under any forage land as long as it remained profitable for hay. This doubtless was due to the fact that much difficulty was experienced in securing good stands of hay.

The development of industrial centers and good roads removed from all parts of Maryland the necessity of a one-crop system. With the exception of a very limited number of farms in the tobacco area, all farms in this State are of the diversified type. The crop areas remain comparatively uniform from year to year, and the capital invested in machinery, work animals and implements assumes a rather fixed relation to the total crop area and the total capital. Under this type of agriculture local markets are of primary importance and few changes of a temporary character need be or can be made to meet an emergency situation. Grouping changes that are made are usually of the revoluntionary and permanent type, and are very slowly achieved. In other words the agriculture in an area like Maryland is characterized by its diversification, by its stability and by the fact that it is subject to few changes. Such changes that do take place normally are rather profound but they are brought about so evenly as to cause no disruption in the general economic situation.

Doubtless the most important change that has been affected in the cropping system of Maryland occurred during the closing fifteen years of the last and the first ten years of the present century. It involved the general abandonment of one crop, the expansion of the acreage of another, and the most important step in soil conservation taken to that time.

On account of repeated low yields and partial failures with spring oats, a general change was made in which a second crop of wheat replaced the spring oats crop. In the four year system then adopted there was a crop of corn followed by two crops of wheat and one crop of hay. In the five year system, there was the same succession of crops except that there was an additional year of either hay or pasture. On some farms where the oat crop was abandoned, the four-year rotation was changed to three years and the five-year rotation to four years. The purpose was entirely economic in that the returns from the additional wheat crop was higher than from a crop of spring oats.

It is not probable that soil protection was a primary thought at the time this extensive change took place in the cropping system about thirty years ago. At least the records do not indicate any such motive. That the abandonment of the spring oats crop and the substitution of a wheat crop with its accompanying winter covering did effect a substantial gain in soil protection is a fact that has long been recognized. Consequently, for more than twenty years, the guiding principle in passing judgment on all proposals for revision of cropping systems has been the probable effect of such change in the system upon the loss of soil.

The extent to which Maryland farmers have adopted systems of farming which will largely protect their soils from both washing and leaching is well illustrated by the figures of the last Census and is also a matter of common observation while driving through the various sections of the State. The corn acreage occupies 20.4 per cent. of all of our plowable

crop land. The other cultivated crops occupy 10.6 per cent. of the crop land. This is a total of 31 per cent. of our total plowable land. Of the 10.6 per cent. more than half is in vegetables for sale but a considerable portion of this area is planted to winter cover crops. It is a conservative estimate that not more than 5 per cent. of all land in cultivated crops other than corn, remains over winter without a protective crop, and most of this is in the flat lands of the Coastal Plain. On the other hand, small grains harvested occupy 22 per cent. of all plowable land in Maryland. This leaves unprotected a net difference of only three per cent. of all of our plowable crop land or to state it the other way, 97 per cent. of all cultivated land in Maryland is planted to a crop that will contribute effectively to soil conservation during the winter months. The value to our agriculture of our cropping systems as a means of conserving our soil resources defies all attempts at expressing it in terms of dollars.

The big problem before the Maryland farmer is that of growing all of the forage needed in his farm enterprise and the major portion (about 75 per cent.) of the grain feed supplies also. To do this, however, the corn supplies now grown must be supplemented with small grains. It is not any more profitable to grow spring oats now that it was forty-five years ago. Fortunately, winter barley has been sufficiently tried to make its production a safe practice, and its full use on all livestock farms would bring not only our feed grain production into better balance, but would measurably improve the soil protection practices as well.

The fact that the diversity in our cropping systems lends itself admirably to permanent agriculture and soil conservation does not mean that we have used every device at our disposal. These possibilities, through the Soil Conservation Service have been thoroughly presented at this meeting. It is to be hoped that the work may grow to the point where every section of the State will make use of the service.

THE ECONOMY OF HOME GROWN FEEDS

By A. B. HAMILTON
University of Maryland

During the past few years I have had occasion to study about 2,000 farm records of farms located in practically every county in Maryland. From these records I have concluded farmers must do one of two things either increase cash receipts or reduce cash expenses. Cash receipts have been increased materially in the last year, but the things farmers buy have increased in price, therefore, the only alternative is to reduce cash expenses. When economy is necessary it is but logical to start with the large items first, therefore, this morning I wish to discuss with you the possibilities of reducing the cash outlay for feed.

In 1930 Maryland farmers spent over ten million dollars for feed. Exact

data for recent years is not available, however, it is estimated to be slightly over eight million dollars for 1936. These large figures are hard for most of us to really grasp, but let us just remember it amounts to over nine tons of purchased feed per Maryland farm.

A few years ago farmers were urged and followed the recommendation to buy high protein commercially mixed feeds, little did they realize that even in those "good times" more could have been made by using more home grown feeds. Let me draw you a word picture of a successful farmer and an unsuccessful farmer. Just picture two farmers going to the receiving station. Each has two cans of milk in the back of his wagon; now picture the one farmer returning home with two empty cans while following him in the distance is the neighbor with his empty cans and two bags of feed. That picture might be called success and failure or contentment and despair.

During the previously mentioned period, it was the usual practice for farmers to sell their grain and buy commercial feeds. Economic conditions changed all of this and today farmers are buying less and raising more of their feeds. This is not a new idea. It has been going on for several years, but recently it received momentum from two crops; namely, alfalfa and barley. Since 1909, the acreage of alfalfa increased from 3,186 acres to 34,166 in 1934; since 1929 the acreage has risen from 21,214 to 34,166 acres; that is about thirteen thousand acres in five years. The most phenomenal increase of any crop is taking place in the acreage and production of barley. In 1919 the acreage of barley was 3,878, in 1929 it was 9,829, but in 1934 it had leaped to 36,869 acres and reports for 1935 indicate a continuation of this rise.

Why have we had such a great increase in feed crops? It is because farmers have learned it is not the highest production but the most economical production they must approach if they are going to make money. The present practice for economical production, especially among dairy farmers, is to raise as much of the feed as possible and supplement it with high protein feeds such as soy beans, cotton seed, or linseed oil meal.

Experiments show that cows can produce economically on good alfalfa hay, corn silage and home grown feeds. The growing of soy beans on dairy farms is increasing rapidly. They are usually cured and fed as hay. However, where soy beans can be cured dairymen have found it advisable to harvest the seed and use them to balance the protein content of the other home grown feeds without any purchase of feed.

Since barley has been increasing so rapidly there must be some basic reason back of it.

Barley yields much heavier than either oats or wheat and therefore, yields more digestible nutrients per acre.

Comparative Analysis of an Acre of Selected Crops in Maryland, 1935

Crop	Yields		Lbs. of Digestible Nutrients*	
	Bushels	Pounds	Crude Protein	Total
Barley	34½	1,656	149	1,315
Wheat	20½	1,230	107	980
Oats	28	896	87	631

*Based on Henry and Morrison's Feeds and Feeding.

In 1935 an average acre of barley yielded 149 pounds of crude protein, as compared with 107 for wheat and 87 for oats, likewise the total digestible nutrients were in the same proportion with 1,315 pounds for barley 980 for wheat and 631 for oats. That is why barley has increased, and if it is made easier to handle there is no reason to doubt but that it will continue to increase.

Many different rations might be suggested in which home grown feeds are used in varying proportions and supplemented with whichever high protein feed is cheapest.

The following rations are used widely in Maryland, and are presented to show some of the possibilities of home grown feeds.

Commercially Mixed	Home Grown A	Home Grown B
520 lbs. yellow hominy feed	666 lbs. corn	800 lbs. corn
380 lbs. distillers dried grain	334 lbs. oats	600 lbs. barley
360 lbs. oat mill feed		600 lbs. 32% mixed feed
180 lbs. cane molasses	334 lbs. barley	
100 lbs. wheat bran	666 lbs soybeans	
80 lbs. cotton seed meal		
80 lbs. soybean oil meal		
20 lbs. calcium carbonate		
20 lbs. salt		
2,000 lbs.—16% protein $27.90 per ton f.o.b. Balto.	2,000 lbs.—16% protein $22.00 per ton	2,000 lbs.—16% protein $24.30 per ton

Experiments have proven that by feeding such home grown feeds as those given in the above ration and feeding corn silage and alfalfa hay, or good clover hay no extra minerals are needed.

The cost of grinding is not included as this cost varies widely and most farmers do this operation themselves, however, since the commercial feed is f.o.b. Baltimore it is safe to assume the cost of grinding would not be more than the cost of transportation on the commercial feed.

According to the rations used there is a saving from three to five dollars per ton on feed. This does not tell the whole story for we have been dealing with total costs. By using home grown feeds the cash outlay is decreased. As one farmer stated "three years ago my feed bill was over $1,300; but since I started raising my own feeds I now spend less for feed in a whole year than previously in one month." Farmers must realize they can grow their own feeds and by so doing eliminate transportation costs, commissions, and most of all, the cash outlay. When this is followed farmers will have a farm program that no court of law can touch.

In closing it is well to mention one more factor. Dairy prices are up about as high as is to be expected and with the plan of reducing the acreage of feed grains in the Mid-West there is not much chance for feed prices to come down, therefore, farmers can wisely adopt and follow a plan of "Farm First for Food and Feed."

A PROSPECTUS FOR AGRICULTURE

By EVERETT C. WEITZELL
University of Maryland

My subject is a rather large one and there is much I could say. I have chosen to be a bit philosophical in some respects and to follow the tendencies that seem to be inevitable in the future of agricultural people.

Instead of attempting to blandish the conditions that exist I am interested in pointing out to you some of the salient detrimental tendencies that have been present in our midst, during the last decade. I might compare such a manner of attack with a rear-vision mirror on an automobile. We look backward to see what is behind, in order that we may go forward with greater safety.

It is important to approach such a complex situation from several angles. The rural aspects of modern civilization, particularly the utilization of land, and the resulting production and consumption, must be treated according to their many related aspects. However, I do not propose to cover them all.

Not the least important is the direction of the people in the behalf of a good life and the problems and prospects for a happy, useful living. Much depends on the philosophy and mental attitudes of the people, if their prospectus would be a happy one. The youth of our farms must be given the necessary impetus to establish comfortable farm homes so that they may provide a stabilizing influence on agriculture.

The rush and speed of modern American society, during the last decade, has not permitted the people to orient themselves and to take inventory of their social status regarding their future ability to live and maintain a "good life"; a life that will persist, perpetuate and provide the greatest

amount of satisfaction to the greatest number of people for the longest time. Rural society has become involved less slowly, in this predicament, but the seriousness of the circumstances has been accentuated by the recent depression. Society must be aided in combating the unstable, spendthrift tendencies which would destroy the factors of thrift, frugality and spiritual morale that have made possible the growth of a great nation.

Rural attitudes of cooperation in both economic and social aspects must be instigated. The farm and the farm home must be a *mode of life*, as well as a means of economic support. The home, the neighborhood, and the community must again become the center of rural interest. The expensive life of the near-by town will, of economic necessity, be abandoned.

Instead of a commercial type of agriculture, selling everything off the farm, it will ultimately become necessary to consume more farm products on the farm. Our people have proceeded in a crude manner, from a long-time standpoint. We have mined the resources and spent our earnings promiscuously for those commodities of a luxurious and temporary nature. We have been unethical and immoral in our program of land use, and our concepts and values of judgment have been commercialized. Even the human element of society has been commercialized and neglected. We have forgotten how to *live*, and enjoy ourselves. Our people have depended on commercial entertainment at a price they cannot continue to pay. Every cent of cash available has been paid for automobiles, gasoline, and other services and commodities, of only a temporary nature. Meanwhile, the farmsteads have been allowed to deteriorate. The pride of a well fenced farm and a neat, orderly farmstead has been lost, temporarily, we hope. For illustration, four hundred dollars is a minimum annual cost of maintaining an automobile. Apply this sum to the maintenance of a farm home and think of the comparison and the two results as they represent permanent values to the people.

Rural rebuilding maybe the next step. Community cooperation and the rejuvenation of local interests must be emphasized. Community organizations, both social and economic, must be revived to provide needed functioning. Better homes, and prideful farmsteads will be the future approach to this situation. More wealth must be retained on the farm if we are to reiterate the ideals of our forefathers in establishing a permanent agriculture.

Our efforts should be given to the effectuation of a long-time program which will develop the will of the people. If such a program is to be effective the objectives must be clearly and concisely outlined and constructed. The feasibility of such a program will depend largely on a well organized, practical basis from which to build. There are no organizations better situated to organize and administer such a program of rural rejuvenation than those represented here today.

Rural Farm Population

Any program, so designed, will depend extensively upon the decisions of rural youth, as to whether they wish to perpetuate a stable and permanent farming country. In the early years of American development, agriculture offered great opportunities to young people for the building of homes. Agriculture still offers such opportunities, but young people must become imbided with the ideals of this type of life, in place of the glamoring attractiveness that the city has offered in past years. There are going to be opportunities for some rural young people in industrial and professional fields, but due to a somewhat saturated condition of such fields of employment, that have been open to farm people since 1929, there will be, of necessity, a greater proportion required to remain in agriculture.

This does not necessarily mean a lower standard of living, but it will mean a different type of living. Farm people cannot continue to buy those commodities that can be raised on the farm because the prices received for commodities sold is generally from ten to twenty-five per cent. less than prices received for products sold, except during periods of unusual demand for agricultural products. During past months prices received for farm products have been encouraging and it is quite possible that during 1936 they will be even higher, but through no sighted circumstance can it be evident that farm prices can equal those of industry. Hence, it will not be profitable to buy those products that can be more profitably produced and consumed on the farm. This not only includes those requisites of production, but those necessaries to the farm family as well.

It is interesting to note that during each year since 1929 the value of products retained on the farm for human and animal consumption became less. During the depression years the cash income available for purchases to provide commercial products instead of home-grown products also decreased rapidly. Furthermore, it is also true that in 1933 and 1934, during which time gross farm income increased two billion dollars, there was no decided increase in consumption of home-grown commodities. It may be said that every unit of farm produce had to be sold in order to obtain necessary interest and debt payments. This is not essentially true because during the same period much refinancing at lower interest rates and lower debt payments was taking place. Farm prices were also advancing. It seems quite reasonable to assume from these facts that, should the amount of farm products retained for home consumption have been greater there would have been less serious results noticeable in the discrepancy between the prices received by farmers and the prices paid for commercial commodities bought by them. In other words, had farmers during this period, consumed more home-grown products and paid cash for less commercial products the net benefits would have been decidedly in their favor.

There has been an increase of approximately one half million farms since 1930, according to the 1935 census. This increase has occurred mostly in regions of poor soils and mountainous topography, where land is cheap. In addition to the increased number of farms, these areas have been recipients of many unskilled laborers who had left the farms in years past in favor of industrial employment, but were forced to return, during depression years. There has also been a decided reduction in the number of young people who have been able to find a livelihood elsewhere. Hence, there has been an increase of twenty-five to fifty per cent. in the population of these marginal and sub-marginal areas. These areas were hardly capable of producing the requirements of the minimum population. With the enormous increase, the situation becomes seriously complex.

It is estimated that by 1940, these people who have been stalled on farms, will require at least one and one-half million additional farms. A paradox arises. From the standpoint of the individual farmer and market requirements, fewer and not more farmers are needed, but the future of our nation depends on these families becoming permanently situated on the soil. They may be situated somewhere else at present, but another turn of the cycle and our condition would be equally as bad.

Urban birth rates are below that number required to maintain the present population. We have surprisingly great proportionate increase in the numbers of old people.

A resumption of the movement of farm youth to the cities would relax the pressure on the land, and suffice the present replacement needs in the cities, but would undoubtedly hasten the decline in the nation's population because of the low birth rate which seems to be an inevitable accompaniment to urban life.

These changes are far-reaching, involving the future circumstance of agriculture, industry and the national economic and social welfare. The vigor and vitality of a nation may depend on the youth. Perhaps this problem is so serious that there should be greater effort expended to increase the desirability of a farm life in the minds of American youth. On the other hand, with so great a percentage of our population approaching middle age during the next twenty years the nation should be in the "Prime of Life." Possibly it would be, providing we could so reorganize our scheme of living to coincide with this unusual circumstance.

But, the period following the next couple decades is of interest also. There must be that new crop of middle-aged coming on to take the places of older ones. This is not possible if our farms are not provided with the desirability and the purchasing power to maintain a stable and frugal livelihood.

Agricultural Planning

Many changes are rapidly taking place in our policies of land utilization and crop production. It seems quite feasible that the policy of *laissez faire* has definitely served its period of usefulness. The policies of conservation and general welfare for the future as well as the present are creeping in. Agricultural *planning* and land planning are gradually replacing the let alone policies. People are beginning to think about their prospects for the future. Wasteful use of natural resources has begun to bear hard on the conscience of those responsible. The realization that our national safety lies in the possibility for a larger proportion of our population to find security on the land, necessitates these recent forward steps.

The relation of a government to agriculture and the use of land for all purposes needs much consideration in the future. The counties, states and the Federal government are assuming the control of more and more land. Our problem is to find out what land government should own, and its relation to the rest of the area.

It is becoming increasingly evident that our antiquated system of local government is a serious burden upon some areas. The cost of administering municipal and county government is exorbitant in many instances. There is duplication and overlapping of governmental units. Perhaps we need a redistricting of our States for local government. With our modern means of communication and the States constantly assuming more local administration, it seems quite obvious that many of our colonial procedures of government should be subjected to a reorganization.

I wish to emphasize these facts. Few people have thought about it, but in the near future these practices will become increasingly important. If you will remember Dr. Symons, in his address to you last year, mentioned the fact that we were approaching a planned program for agriculture.

It has been estimated that fifty per cent. of our commercial production comes from less than ten per cent. of the population, while more than twenty-five per cent. of our population contributes only three per cent. of the products sold from farms. "A better distribution of our industrial production, combined with the development of a scientific type of commercial farming accompanied by family self-sufficiency, and a further integration of agriculture and industry, in what may be termed part-time farming, may make it possible to give a much larger number of families access to the land without further complicating the problem of agricultural surpluses."

Another step in our planning program is those adjustments within the types of cropping in the many regions and counties of the country. I do not advocate a political planning that would have as its goal a Utopia. Such a program must be conceived and formulated on a basis of keen

practicalities. It seems certain that a sound basis for such planning is being worked out in each State, in the form of county planning.

"County planning," says C. W. Warburton, Director of Extension, "is an attempt on the part of cooperating agencies to reach into the farming communities, even to the individual farmers, for the solution of agriculture problems. The idea presents an opportunity for research, adjustment, erosion control, and extension to move most efficiently toward county, State and national agricultural programs.

These programs are long-time objectives and only by that means can they possibly be successful in producing a satisfactory permanent benefit to agriculture.

Obviously, such programs will necessarily be a result of much effort and thought in determining the programs for the areas and regions within the States. The success of such a program will depend on the cooperation of the various agencies in organizing each county, and each area, in order that any beneficent results may be obtained. In a final analysis, the the farmers' organizations and the farmers themselves must adhere closely to cooperative effort in gaining the desired results.

Such cooperative effort will be continuing and dynamic. Adjustment measures will keep in step with the needs that can be determined in an approximate manner.

In order to obtain a prospectus of such a program, the following schedule has been formulated:

1. "To determine for the various regions the type-of-farming areas in each State and region; the nature and adjustments in agriculture, including combination of crops, pasture, and livestock on individual farms, that would

   (a) maintain and increase real income to producers.
   (b) conserve the land and improve soil productivity, consistent with rural welfare and the conservation of agricultural resources.
   (c) contribute to State and national goals in production of specific crops.

2. To determine criteria and procedure for bringing about the desired adjustments."

In addition to the necessary research in determining the above, the following points are equally as important if maximum benefits are received.

First, bring facts to the attention of the farmers for their appraisal and consideration. The several farm organizations can serve a worthy purpose at this point, as well as those to follow. They can aid in interpretation and explanation of the data supplied by the State and Federal agencies.

Second, develop methods of administration for a nation-wide program based on aforementioned concepts.

The *modus operandi* necessary in each area and county in the country is now becoming available under the national extension project for county agricultural program planning. This consists of the extension phase of the program, for the application of the material worked out and organized by the experiment stations. Practically every State has such a program under way this winter.

This extension project provides for the organization of farmers' committees in each county for the purpose of arriving at sound adjustments for major crop interests of the particular counties. These committees are to be supplied with the material and information, through the county agent's extension office, that is made available by State and Federal research departments.

"The county agricultural planning idea carries with it many opportunities to use material already assembled by extension workers. With the development of county plans, greater uses will be found for the studies of types of farming, soil conditions and types, erosion control, soil fertility conservation, and other features which must be considered in long-time farm adjustments. The discussion of such adjustments with farmers will bring from them suggestions for the solution of their own problems. The State agricultural planning committee, or whatever body is designated to do the work, will consider the solutions offered by the various counties and will summarize them for the State, finally reporting its recommendations to the Department of Agriculture.

"From the suggestions of the States, a national policy for a planned long-time agricultural program may be developed, returning benefits to individuals and communities throughout the country. In this way, county agricultural planning, long in the hearts, minds, and activities of extension workers, may be advanced toward the realization of an ideal in cooperative farm planning."

There is all reason to believe that farmers will use the information supplied them and will give much effort and cooperation in effectuating this program.

Our future program of agriculture planning must deal with the problems directly, and not generally—too general to reach the strategic points necessary for permanent benefits. Farmers will play an increasingly important role in formulating programs for their localities and regions. In this way the various farm organizations and governmental agencies serving in the field of agriculture will serve as instrumentalities through which the wishes and ideas of the farmers may be transposed into plans of action. As such action steadily takes place, the benefits of agriculture planning will gradually become evident.

Production and Consumption

Some writers are prone to forecast that the efficiency of production, present during the past decade, will relinquish its hold on agriculture. But as I have outlined the probable future program to you, efficiency is an underlying requisite. Many shifts will be made from less productive crops, per acre, to those more productive. Those crops that can be grown more profitably for home use will be substituted for those grown and sold at very small or no profit.

Every effort should be expended to hold all foreign trade possible. However, in some cases where this trade consists of special commodities, this prospect is not encouraging. In view of all the facts it seems that our agriculture is headed toward a greater self-sufficiency, unless some unforeseen developments create a demand for commercial and foreign consumption of farm products.

With the disappearance of surplus and carry-over commodities, the present tendency is higher prices for farm products during 1936. With a season of normality, this should improve rural buying power, and again permit normal purchasing in rural areas. However, this normality of rural purchasing cannot be permanent unless strict adherence to the principles that I have outlined to you is practiced.

Agricultural production will gradually level off to a flow that can supply the available demand as various adjustment programs are practiced and the affected commodities are kept within reasonable volume.

The burdens of production, debt and taxes, have recently shown improvement with the aid of governmental finance and lower interest rates.

Labor promises to be more plentiful and cheaper with a resumption of normality with respect to relief and Federal work programs.

Business Activity in General

General business activity which is closely integrated with all agricultural interests has been improving steadily during the latter part of 1935 and continues toward encouraging levels. Although it still remains more than ten per cent. below the estimated normal, there are prospects that even greater improvement will come about during the coming year. As this improvement approaches normality, the radical fluctuations away from the general trend will become less pronounced.

I am positive that the people of Maryland, especially the farm people, are going to take advantage of this upward trend and grasp the ideals of a bigger and better farm and home life through a planned agriculture. By such a process we shall be able to prevent another period of chaos and misfortune such as we hesitate to look back upon, and the "family farm and individual initiative will remain characteristic features of American agriculture."

NEW GRAINS AND HYBRIDS

By W. B. KEMP

Professor of Genetics
University of Maryland

In the January number of "Scientfic Monthly," Secretary Wallace presents a most interesting article under the title of "Research—The Yeast in the Loaf of Agriculture." In this article Secretary Wallace presents results of agricultural research in many fields. One of the accomplishments which he recounts is the development of Thatcher wheat. Thatcher is a spring wheat developed through cooperative effort of the United States Department of Agriculture and the Minnesota Agricultural Experiment Station.. According to this statement, an epidemic of stem rust in 1935 damaged wheat in North Dakota alone to the extent of $100,000,000. In this epidemic Thatcher showed greater resistance to black stem rust than any other wheat. Had it occupied all of the acreage of the State, most of this loss would have been avoided. Of course, black stem rust is not epidemic every year. However, this variety is adapted to most of the 15,000,000 acres annually planted to spring wheat in the United States, as well as large acreage in Canada, and its general adoption might readily add more than 15,000,000 bushels to the average wheat crop of the United States alone.

It is the other side of the picture which concerns me principally at this time. Naturally we have every sympathy for the North Dakota farmer in his struggles against the scourge of black stem rust, but we must not forget that every crop failure in his fields results in increased prices for Maryland wheat. To the extent that damage from this disease is prevented, to that extent prices to the consumer are reduced and wheat acreage elsewhere, including Maryland, is driven out of production by the new competition. That is, Maryland acreage is driven out of production unless equally improved varieties are developed and distributed here.

Fortunately, our own Agricultural Experiment Station has developed wheat strains with superiority over established varieties probably just as marked, on the average, as Thatcher manifests in the area to which it is adapted. With their general adoption, our competitive position in wheat production should be maintained.

There is another fact to be remembered in this connection. Almost every big corporation has its research staff working to give to the corporation it serves advantages over competitors in quality or economy of output. Every one of the forty-eight States has the plant breeders of its Agricultural Experiment Station endeavoring to produce new strains of plants that will improve the competitive position of the farmers in the States they serve. They are working not only with wheat, but with many

crops. In this struggle the small agricultural area, like the small corporation, is at a disadvantage because its funds for research are relatively limited. This difficulty is intensified, so far as plant breeding is concerned, by the activities of the Federal agencies, due to the fact that plants developed for one region, typically are not adapted to another one. I quote from the same article by Secretary Wallace which was referred to previously. In his discussion of the function of research in the Federal Department of Agriculture he states: "It can and should concern itself with problems that affect the whole country, or great regions, and that are above the conflicting pull of purely local interests." The great spring wheat region in which Thatcher was developed, by the cooperative effort of the Federal and State workers, covers many States. Its problems are "above the conflicting pull of purely local interests." Therefore, its 15,000,000 acres of wheat attract the services of Federal as well as State breeders. The central States grow 30,000,000 acres of winter wheat. In contrast, the Eastern grain region is small. The North and South Atlantic States, which include this region, grow only 3,500,000 acres of wheat. Each important strain or variety is adapted to an area too small to enlist much effort by Federal workers. The States of this region must depend upon their own experiment stations chiefly. Farmers or commercial seed houses can not be depended upon to develop new field crops. I do not know of a single promising small grain variety that has been developed within the past twenty years by any private individual or agency. These plants can be propagated so rapidly, from a small initial seed stock, that the one who devoted much time and money to their development would not be paid for his efforts. Therefore, the job will be done only by a public agency.

A high producing strain of cattle or of chickens is high producing in almost any region within the country, but a wheat adapted to Kansas would give very poor yield in Maryland. Even within our own State we have never been able to recommend the same strain for all areas. In fact we have not been able to reduce the number of recommended strains below three. However, the area of adaptation for these strains extends into adjacent States. On the other hand, within the central states one strain may be adapted to very large areas.

Even clover from adapted local strains has demonstrated its superiority in various tests and in the experience of farmers of the areas where seed is hulled.

I believe my conviction has been made clear that this State, if it is to hold its position in crop production in the face of the competition from other States, must develop and maintain its own seed sources for most of the general farm crops. Also, it must carry clean foundation stocks of seed for distribution to the commercial seed growers as their stocks become contaminated.

In the light of the foregoing statement of our needs, let us take stock of our present condition.

Since wheat has been used for purposes of illustration in this talk, let us consider this crop first. Years ago it was demonstrated that wheats of the Fulcaster response type were well adapted to the coastal plain, and low valleys where certain diseases were likely to affect the crop severely. At the same time wheats of the Fultz response type were well adapted to the high areas of the Piedmont Plateau. Leap had come to occupy the areas intermediate in elevation and air drainage. It seemed logical to effect a cross between the best wheats of the Fulcaster and the Fultz response types and attempt to isolate from the hybrid progeny a strain that would combine the favorable characteristics of both parents sufficiently so that the one strain would be superior to existing types in all parts of the State. Accordingly, such a breeding program has been carried for the past dozen years, and from the resulting strains one has been isolated that shows some promise. However, it is probable that this one will never receive public notice for, in the meantime, the Leap variety has been analyzed to isolate the best strains it might possess. From among these, two have been isolated that show such great promise that they may replace all other wheats throughout the State, except in the lowest parts of the Coastal Plain. Further tests may demonstrate their ability to compete successfully even here. During the past seven years at College Park these two selections stand first and second in average yield. During that time one of them has exceeded the parent in yield by ten per cent., and the other has exceeded the parent by nearly eleven per cent. These strains have not been tested in all parts of the State. However, the one which has been distributed under the name of Leapland appears to yield elsewhere in keeping with its response at College Park. Eventually one or the other of these strains should occupy at least 300,000 acres, or 75 per cent. of Maryland's wheat acreage. The remainder of the program, as it applies to these wheats, will require extensive comparisons with established varieties in all parts of the State, anl the maintenance of clean foundation stock for distribution to seed growers.

A breeding program never ends. As new conditions, new diseases, or new strains of existing diseases make a change necessary, new wheats must be at hand to replace the old. Therefore, in future years we can expect to be called upon for new wheats to replace those which are distributed now just as these are replacing the strains that have been distributed in the past.

The wheat surplus that piled up in a few years following the World War made it seem advisable to bring barley into a more prominent place in the agricultural economy of the State. However, beardless or hooded-barleys can never compete with bearded types in yield. Also the Tennessee Winter variety commonly grown in Maryland has very short straw and heavily barbed beards. The straw is so very palatable that farm

animals persist in eating it when it is used for bedding and the barbed beards are likely to cause sores in their mouths. Then, too, the crop is disagreeable to handle. To permit barley to come into its rightful place, these objections should be overcome. Accordingly, breeding material was assembled in 1925. A barbless, but unadapted barley had been introduced from Russia and used in crosses with Manchuria to get the barbless condition into an adapted spring barley for the North Central States. One of the first promising strains isolated from this cross was given the name of Velvet. A sample of this velvet barley was obtained at the Maryland station and in 1925 and 1926 it, together with Tennessee Winter, was planted at successive intervals in the open and in the greenhouse to obtain plants of both that would be in blossom at the same time. A number of crosses between these two varieties were effected in the spring of 1926. By 1928 it was possible to isolate barbless strains, but the recovery of winter hardiness was a much more difficult task. Plots were planted at two weeks intervals from early October to late November to insure that a planting time would be sampled late enough to cause heavy winter killing, but early enough for some survival. Seed was saved from such heavily winter-killed plots and used for planting the next year. This process was continued for several years until all strains had been winter-killed except those with winter-hardiness nearly as great as the Tennessee winter parent. From the surviving strains promising barbless ones were isolated, compared and increased. The best of these have been carried for two years in duplicate drilled plots where the most promising one has produced an average height of 110 per cent. and an average yield of 121 per cent. of the Tennessee winter parent, along with 23 per cent. more straw and freedom from barbs on the beards. The two-year yield average has been nearly 56 bushels per acre, in comparison with 46 for the parent. Superiority so great as this is too much to expect in a series of years. However, there is no question that the yield improvement is quite marked where this strain will survive the winter. Additional comparisons between these barleys must be continued at College Park and in various parts of the State. Also, foundation stocks of them, as well as the Tennessee winter parent must be carried by the station as a source of pure seed for commercial seed growers. In the meantime, the breeding program is continued in an effort to obtain increased winter hardiness.

Dr. Rothgeb is speaking before another section at these meetings on results of the program of breeding and comparison of sugar corn varieties and hybrids.

The present field corn plots permit a continued comparison of many varieties now in the State. However, these plot series must be expanded to make room for detailed comparison of the various hybrids now on the market. To date we do not have sufficient data to permit us to recommend any of the new field corn hybrids for the different parts of Maryland. Our own breeding program with field corn has been delayed because

of insufficient space. Of course, you all realize that sugar corn and field corn for seed production can not be carried in close proximity to each other.

There is a great need for the establishment of a foundation seed stock of clean local red clover, if local strains are to be made available to all parts of the State. All yield comparisons have demonstrated the superiority of such seed. Also other field crops should be included in the breeding program. However, foundation seed of the plant strains now developed can not be carried in stock until additional experiment station land is available for crops work.

REPORT OF THE SECRETARY-TREASURER FOR THE YEAR 1935

January 16, 1936

The State Corn Show now being held at this hotel is as large and attractive as any that this Society has ever sponsored. The quality of the exhibits is unusually high and the number larger than last year. There is also an unusual number of potatoes of high quality exhibited and the combined show is one to justify pride.

Following is the number of entries in each class, the number of prizes given and the winner of first place.

Class I. Johnson or Boone County White, 19 entries, 15 prizes.
C. K. Holter, Jefferson, Maryland, first place.

Class II. Reids Yellow Dent, 21 entries, 15 prizes,
Tobias Zimmerman, Frederick, Maryland, first place.

Class III. Golden Queen, 34 entries, 15 prizes,
Norman Warehime, Westminster, Maryland, first place.

Class IV. Lancaster County Sure Crop, 11 entries, 10 prizes,
Eleanor Galt, Westminster, Maryland, first place.

Class V. Other Varieties, 6 entries, 6 prizes.
O. W. Burtner, Sharpsburg, Maryland, first place.

Class VI. Interstate Class, 5 entries, 5 prizes,
John S. Ward, Hamilton, Virginia, first place, winner of Grand Sweepstakes.

Maryland Trophy—Tobias Zimmerman, Frederick, Maryland, for the best ten-ear exhibit of Maryland corn.

The Corn Show was judged by Professor George Schuster of the University of Delaware and Professor Geary Eppley of the University of Maryland.

At the business meeting at the close of Thursday's meeting the following officers were elected for 1936:

President—Matt Harding, Cambridge, Maryland.

Vice-President—Maynard Hawkins, Frederick, Maryland.

Secretary-Treasurer—F. W. Oldenburg, College Park, Maryland.

In addition to his other duties, the president is to represent the Society as delegate to the State Farm Bureau Federation and the Secretary-Treasurer as delegate to the Agricultural Corporation of Maryland.

TREASURER'S REPORT

Maryland Crop Improvement Association

January 1, 1935, to December 31, 1935

Receipts

Book balance January 1, 1934	$81.29
Appropriation from Agricultural Society	158.00
Dues paid by members (1935)	1.00
Dues paid by members (1936)	1.00
Dues taken out of awards	41.00
Total Receipts	$282.29

Expenditures

Maryland Farm Bureau dues	$20.00
Trophy	17.00
Awards	94.00
W. R. Ballard, awards for Potato Show	36.00
Dues taken out of awards	41.00
Cash in Bank, December 31, 1935	74.29
Total Expenditures	$282.29

Baltimore, Maryland, January, 1936.

We, the undersigned, have examined the books of the Treasurer of the Maryland Crop Improvement Association and have found them to be correct.

AUDITING COMMITTEE,

H. M. CARROLL.

HORACE B. DERRICK.

REPORT
OF THE
TWENTY-SEVENTH ANNUAL MEETING
OF THE
Maryland State Beekeepers' Association
January 15, 1936
Baltimore, Maryland

The Twenty-Seventh Annual Meeting of the Maryland State Beekeepers' Association was held on Wednesday, January 15, 1936, in conjunction with the Maryland Agricultural Society-Maryland Farm Bureau Federation meetings in the Lord Baltimore Hotel, in Baltimore.

The meeting was called to order by President S. R. Damon at 7.00 P. M. He gave the usual address by the President.

Following this Dr. E. N. Cory, Secretary-Treasurer, made a report.

Mr. George J. Abrams, Specialist in Apiculture, University of Maryland Extension Service, gave the following address:

REPORT OF EXTENSION ACTIVITIES IN APICULTURE FOR 1935

By GEORGE J. ABRAMS
Specialist in Apiculture

The work of the Extension Specialist in Apiculture was unfortunately curtailed during the summer of 1935 because of a serious bone infection of the right hand. It was unfortunate that this disability occurred at the busiest time of the year, necessitating a suspension of all work for the month of July and rendering inspection work after July 1 impossible.

The inspection work suffered most from this incapacitating of the extension worker. The program of work as submitted at the beginning of the year was not followed as outlined, but was altered considerably to meet the exigency.

EDUCATIONAL WORK

The greatest need of the Maryland beekeeper is instruction in bee be-

havior and the fundamentals of colony manipulations and apiary management. With this need in mind, more time was allotted to this part of the yearly program than to the other phases of the work. Beekeepers in all parts of the State, many of whom are just learning of the existence of a State worker in apiculture, indicated an increased desire for instruction. They want this instruction in the bee yard where personal instruction can be given, where they can ask questions and can be actually shown how things should be done. The extension worker has expressed the belief in previous annual reports that there is no adequate substitute for this method of teaching bee culture and that whatever else is done can be only of an auxiliary nature.

GENERAL WORK IN THE APIARY

In working with the beekeeper in the apiary, it was the policy not only to help him with the things for which he requested help, but to outline a yearly plan of colony manipulation and apiary management. It is believed that the most valuable instruction and information given to the beekeepers was dispensed in this way. First the apiary site is discussed and recommendations made for altering it if advisable. Then the yearly cycle of work is discussed, starting with the preparation of bees for winter, continuing with spring management, swarm prevention, control practices, methods of supering, removal of the honey crop. This brings to mind many questions which the beekeeper often would not have remembered to ask at the time. Next, the problem of equipment is gone over thoroughly and recommendations made. The preparation of honey for the market is discussed and recommendations regarding pack and suggestions as to outlets are made. Grading, according to the U. S. Standards and Grades for honey, is always urged. Finally all beekeepers are urged to use the cost account sheets prepared by the extension worker. Great difficulty has been experienced in getting the beekeepers to use these record sheets or even record sheets of their own devising. A few men are using them and it is hoped that each year the number can be increased.

REQUEENING

One of the greatest specific needs of Maryland beekeeping at the present time is better stock. A large majority of the colonies in the State need requeening with new queens of good blood. There can be no question but that a general requeening in the State would greatly increase the State average of colony honey production, cut down winter losses and bolster up the whole tone of Maryland beekeeping. At every opportunity, in the apiary, at beekeepers meetings, and through letters and publications, this thought was stressed, as it is felt that this is a fundamental need of prime importance.

It had been the plan of the extension worker to actually do as much of

this requeening as possible in an effort to get the work started, the plan being that the beekeeper should buy queens for a small percentage of his colonies, and the extension worker would do the actual work of introducing them. With this initial help and instruction it was felt that the beekeepers would then be able to finish the job of requeening the remainder of the apiary without further help. This plan was just started when it was necessary to abandon it because of injury. This work will be resumed during 1936. Already a number of beekeepers are awaiting notice, from the extension worker, of when to order queens from the south.

ELIMINATION OF BOX HIVES

Through direct extension work and its collateral effect, more and more box hives are being transferred over into modern movable frame hives each year. This phase of the work will of necessity progress slowly because of cost of new equipment, but with the extension worker and county leaders constantly demonstrating the increased profits to be derived from modern hives, it can be expected that gradually the box hive will be eliminated through education and not make oft proposed legislation necessary.

TWO-STORY BROOD CHAMBER

In conjunction with this quiet steady drive to eliminate box hives, the value of the two-story brood chamber is always advocated. Much success has been made in getting beekeepers to use two brood chambers in place of one. The method of attack has been to urge, almost on a sporting basis, that the beekeeper try out several colonies with the two brood chambers, and run them in competition with one brood chamber hives. Instruction in colony manipulation under the two chamber method is given and the success from the extension and production standpoint has been gratifying. The greatest drawback to this change in colony management is the lack of enough equipment.

EDUCATIONAL WORK ON DISEASE AND PESTS

Work done in the control of the bee diseases and pests is reported fully elsewhere in this report. However, much educational work is accomplished each year in teaching beekeepers to recognize the various bee diseases and pests and how to combat them. Talks were given at beekeepers meetings, instructions were given in the apiary and literature has been sent out, all in an effort to familiarize the beekeepers with the diseases and pests before they encounter them, so that should the apiary become infested or infected they will be able to recognize the trouble immediately and before the condition has a chance to spread.

THE POLLEN BASKET

Even since extension work in apiculture was started in Maryland, a need has been felt for some sort of extension paper through which the extension worker could reach every beekeeper on the mailing list period-

ically, with timely information, notices of meetings, market reports, and other information of general interest. Such a paper was started during 1935 as a monthly, the first issue being sent out in February. It has been continued each month since then.

This paper is called "The Pollen Basket." It is mimeographed, and during 1935 varied in size from two to four pages. An effort was made to prepare a paper that not only carried specific information and timely suggestions, but which would be newsy and readable.

One of the commonest complaints registered against the large established trade journals and government bulletins and bee books is that they are written to be read by beekeepers throughout the country, and often do not apply to the specific conditions of a locality. This of course is unavoidable, as literature with nation-wide circulation must contain general information. "The Pollen Basket" is, therefore, slanted especially for the Maryland beekeepers. It takes the general fact or practice and reshapes it specifically for the Maryland beekeepers.

In all modesty, the extension worker wishes to report that this paper has been almost enthusiastically received. Numerous unsolicited letters attest this fact.

"The Pollen Basket," aside from its educational value in giving definite information relative to Maryland bee culture, has assumed the place of official publication for the State beekeepers and has done much to bring the State group together.

Orchard Pollination

Work with the Maryland fruit growers was of necessity limited only to those orchardists requesting help. With the limited travel funds for apiculture being exhausted each year before all necessary work with the beekeepers can be accomplished, it was decided unwise to attempt any sort of campaign with the fruit growers calling for added expense. The second factor determining this policy is the present shortage of colonies in the State available for orchard rental. There is no point in working up a market that cannot be supplied.

A number of the larger fruit growers are already using bees for pollenizers. Those requesting help were given assistance and several others becoming interested in this phase of orchard management were visited and advised regarding number of colonies needed and methods of securing them.

One radio talk was given in the spring regarding the use of bees as pollenizers in orchards, and an educational display pertaining to bee culture was set up at the annual meeting of the State Horticultural Society.

Honey Marketing and Publicity

In general, it can be safely said that the Maryland beekeeper is not seriously troubled in marketing his crop. The market is as a rule slow, but steady, and it is the usual case that the great majority of the producers sell out their crop before the new crop is produced. There are numerous exceptions to this rule, especially where beekeepers live in isolated parts of the State. This steady demand for honey should be expected in an Eastern State near the large retail markets, and especially in a State embracing a city the size of Baltimore, and in such close proximity to Washington, Philadelphia and New York.

The price of honey has remained good with considerable variation between retail city markets and retail small town markets. Under either condition, however, honey can be sold at a profit.

It is believed that the prevailing fair prices and steady market demand will be reflected in greater State production of honey. This increase can easily be consumed locally.

National Honey Week

Some really worthwhile State-wide advertising of honey was done in Maryland in conjunction with the national observation of Honey Week. The extension worker directed this work in Maryland, and took active part in placing exhibits and radio broadcasting.

First, publicity about Honey Week was given through "The Pollen Basket," and beekeepers all over the State were urged to set up local displays of bee products in stores and other suitable display places. A number of beekeepers responded with attractive displays so that the smaller towns and Baltimore city were well covered.

The State worker contacted two large bakeries; one in Cumberland and one in Hagerstown, both users of large quantities of honey in their bread mixtures, and obtained their cooperation in securing advantageous display space in stores selling their bread. Local beekeepers were then contacted and in each town cooperators were secured to supply enough comb and extracted honey to set up an attractive display. An observation hive was supplied for each display by the extension worker and the live bees were furnished by local beekeepers. The extension worker set up these exhibits at the beginning of Honey Week. They included comb and extracted honey, an observation hive, beekeeping equipment and bread made with honey.

The bakeries were also asked to allow the extension worker to use their time on the local broadcasting stations. They consented and three talks about bees and honey were given on Monday of Honey Week, in Hagerstown, and one talk was given the next day in Cumberland.

In addition to these radio talks, two talks about honey were given at the regular weekly University of Maryland Extension Service's period over Station WBAL, Baltimore, on the two Fridays immediately preceding Honey Week.

The Home Demonstration Agents, through their leader, were asked to observe Honey Week by publishing recipes, using honey, in the local papers and by demonstrating the uses of honey in their work of that week.

The students in apiculture at the University arranged a very attractive display of honey (supplied by a local beekeeper) in the salesroom of the Dairy Husbandry Building at the University.

BAKERIES

Three of the largest bakeries in the State, outside of Baltimore City, using honey were contacted in an effort to gain an outlet for the darker grades of Maryland honey. One bakery, using roughly 75,000 pounds of honey per year, and formerly buying from New York brokers has started buying Maryland honey. Another is now also buying locally as far as they can be supplied. The third bakery is also buying some local honey but being located in a comb-honey area the local extracted honey supply is limited.

FAIRS AND DISPLAYS

Two fair exhibits were set up during 1935 by the extension worker; one at the Timonium Fair, the other at the Harford County Fair. The honey was supplied for both exhibits by the beekeepers and was for competition. The large U. S. D. A. display telling the story of honey was obtained and used at the Timonium Fair Exhibit.

Through the Washington and Frederick County Beekeeper groups, the fair officials of the Hagerstown and Frederick Fair Associations are being contacted as an effort to open premium lists for bee products and it is hoped to add these two large fairs to the list of fair exhibits next year.

Inspection, Disease Control and Pests

BROOD DISEASES

Inspections for brood diseases were limited to those apiaries in which infection was found the previous year. These apiaries were given an inspection during the spring, seven yards, including two hundred and eleven colonies being examined.,

It had been planned to conduct an area clean-up campaign in seven counties, an over ambitious plan rendered impossible not only by the physical incapacitation of the extension worker through illness, but because of lack of funds.

However, much educational work on bee diseases and pests was accom-

plished through personal talks to beekeepers. This is a subject of vital importance to beekeepers in general, and one in which all are interested whether they have had experience with disease or not. As a consequence, considerable time was usually spent in describing the disease, its manner of spread and control measures, to beekeepers on personal visits. Two talks were given at meetings on American foulbrood at which time diseased material was exhibited.

PESTS

An increased number of inquiries were received this year in regard to the Greater Wax Moth, a pest inhabiting bee hives. Help was given when requested and two talks at beekeepers meetings were given explaining the life history and control of the moth.

Another serious pest of honeybees, the bee louse, *Braula coeca*, was discovered and investigated in Montgomery County, and was also located in Washington County. This pest was found to be doing considerable damage to comb honey, rendering sections unfit for sale. Thirty-nine (39) visits. were made to Montgomery County apiaries in an attempt to determine the extent of the infestation. The infested area appears to lie between the Frederick pike and the Potomac river in that area north of Rockville as far as Sugarloaf Mountain. Six widely scattered apiaries in this region were found to be definitely infested, and others are suspected.

Work With the Maryland State Beekeepers' Association

Further progress was made during 1935 in organizing new county groups of beekeepers into chapters of the Maryland State Beekeepers' Association. Particular success was experienced in Washington, Frederick and Montgomery counties. In these three counties are located a large percentage of the Maryland beekeepers.

In Washington County, two meetings were held and the group formally organized themselves into a chapter of the State Association. This group plans to meet once a month with the extension worker. As a group, they cooperated on the Hagerstown Honey Week exhibit as their initial group venture. They also plan an exhibit at the local Food Show and have made the necessary overtures to the county fair officials to obtain a premium list for bee products.

This group is interested in having the extension worker hold regular bee culture classes in Hagerstown, which will be done in 1936.

The Frederick and Montgomery county groups have not formally organized and elected officers, but will do so at their first 1936 meeting. The beekeepers in both of these counties have nearly all been contacted by the extension worker in personal visits and through meetings, and are ready to organize and are desirous of obtaining instructions through bee culture classes.

The Eastern Shore Chapter of the Association, organized last year, met once during July, and the Baltimore group originally comprising the whole of the State Association, held five meetings; one the annual meeting in conjunction with the Maryland Agricultural Society-Maryland Farm Bureau meetings, one summer field meeting and three indoor winter meetings.

These Baltimore meetings were well attended by both beginners and experienced beekeepers. Having two classes of beekeepers present at the same meeting has made it difficult to arrange programs suitable and interesting for both, as a beginners program proves unprofitable and uninteresting to the experienced man and the advanced program goes over the heads of the beginner.

It is hoped to alleviate this situation during 1936 by holding a beginners class in Baltimore, primarily for the novice in addition to the regular association meetings.

PARTIAL-DRONE-LAYING QUEENS

By C. E. BURNSIDE
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Before taking up the discussion of partial-drone-laying queen bees, it seems desirable to review briefly for comparison the work of normal fertilized queens and of unfertilized queens. Queens that have mated normally lay only fertilized eggs in worker and queen cells and unfertilized eggs in drone cells and cells that are larger than the average worker cell. In rare cases young queens may lay a few unfertilized eggs in worker cells before beginning to lay fertilized ones regularly. Old or exhausted queens may lay both worker and drone eggs in worker cells for a few days before they are superseded. The brood of a normal queen with the exceptions mentioned consists almost entirely of worker brood in worker cells, drone brood in drone cells and queen brood in queen cells. Drone and queen brood may be entirely absent even when much worker brood is present. Queens that fail to mate can, of course, lay only unfertilized eggs and their brood consists entirely of drones. These queens are known as drone layers. They usually delay longer than mated queens before beginning to lay but may lay just as prolifically. The eggs are deposited more or less regularly and until the brood is capped it can readily be mistaken for the brood of a fertile queen. Drone-laying queens do not seem inclined, as do prolific fertile queens, previous to the swarming season, to leave the worker comb in order to lay in drone cells.

In rare cases queens become partial-drone-layers at a time when they should be at their best. They lay both drone and worker eggs in worker cells and their brood consists principally of drones and workers irregularly scattered in worker comb. There may also be present drone brood in drone comb and queen brood in queen cells.

This abnormal condition exists in some of the queens inseminated artificially by the method devised by Watson[4] but was more common at first than since the method has been improved. It may be present in any degree when artifically inseminated queens first begin to lay or may develop at any time thereafter.

Partial drone-laying queens are not uncommon among queens that have been shipped in mailing cages. Although the percentage of queens that are affected is usually small, considerable loss occurs at times among queens reared in the South and sent to northern States in mailing cages. The affected queens may be partial drone-layers as soon as they are introduced but more often the disorder does not show up for a few weeks or until the following season. Even the worst affected queens may be prolific layers and have the appearance of normal young queens. Such queens are of little value even though there are but a few drones in worker cells. The percentage of drones usually increase more or less rapidly and the colonies do not prosper. The best remedy is to kill the queen and introduce a normal one or unite the bees and combs with another colony.

When colonies are seriously poisoned from working California buckeye the queens frequently become drone layers. Drone laying is supposed to come on gradually, although this point has not been fully investigated. In case of buckeye poisoning, however, drone-laying queens have returned to normal egg laying when introduced to normal colonies of bees outside the buckeye territory.

When queens remain to head the colonies in which they are reared and are not subjected to injury, they rarely become partial drone layers while they are still young and vigorous. There are, however, a few references to this condition in beekeeping literature. Root[3] states that "any queen is liable any day of her life to begin laying drone eggs altogether or in part." Langstroth and Dadant[1] state that "some very prolific queens occasionally lay drone-eggs in worker cells. It may be due to fatigue." Langstroth and Dadant[2] also report as follows regarding an experiment by M. Barthelemy of France. "A queen may be temporarily rendered a drone layer by exposure to cold, as was proven in an experiment conducted by Mr. M. Barthelemy of Marseilles, France in 1918. He tried the experiment of introducing a young queen by dipping her in cold honey. The refrigeration caused her to lay drone eggs for several weeks after the operation when she again resumed her laying of fertilized eggs." There are other reports of queens laying only drone eggs after having been exposed to low temperatures.

In April, 1932 the writer found two partial-drone-laying queens that were reared during the summer of 1931 in the colonies that they headed at Somerset, Maryland. It seems probable that the condition may have been brought on by some injury to the queens but this was not determined. Since there are but few reports of observations on the work of such queens

it was decided to make observations on the two colonies at Somerset and other colonies with partial-drone-laying queens as opportunity availed. The observations reported below were made on the two colonies mentioned, supplemented by observations on colonies with partial-drone-laying queens that had been shipped in mailing cages and samples from such colonies sent in by beekeepers for diagnosis.

The two colonies were of Italian stock but some of the worker bees in one colony were darker colored than is usual for pure Italians. Both queens appeared to be young and vigorous. In their general appearance, actions, and the position and regularity of their eggs in the cells, they resembled normal fertile queens. They were fairly prolific layers and during most of the season layed in the combs of two standard hive bodies. When the queens were first found their brood showed a typical concentric arrangement. Irregularity of the brood gradually increased but appeared to be caused largely by the difference in the time of development of the workers and drones and by the death of part of the drone brood. At first less than 10 per cent. of the brood consisted of drones but the proportion of drones gradually increased. In September about 50 per cent of the brood in one colony and about 75 per cent. in the other consisted of drones.

The workers seemed to accept both queens as normal young queens. Supersedure either was not attempted or was unsuccessful, since the queens remained in the colonies and no queen cells were observed during the season. Colonies with partial-drone-laying queens that had been shipped in mailing cages have also been observed in which supersedure was not being attempted.

In April both worker and drone brood appeared healthy and drones and workers were observed emerging from worker cells. In May a few drone larvae died before they were capped. Thereafter the death rate among the drone larvae gradually increased and dead drone pupae were also found A few dead larvae were found in cells with nearly flat cappings but owing to the advanced state of decay their sex could not be determined. It seems probable that they were drones. The dead brood resembled that of laying workers and drone-laying queens and showed the same wide variation in symptoms. Some of the dead larvae resembled larvae killed by the brood diseases. American foulbrood could be eliminated in the apiary by the consistency and odor when the appearance of the dead brood resembled that of American foulbrood. Microscopical examination was necessary to distinguish some of the dead larvae from larvae killed by European foulbrood.

By the first week of August the two colonies under observation were noticeably weakened. The bees still occupied the combs of two standard hive bodies but were less crowded on the combs than in case of other colonies in the apiary with normal queens that had been of about equal

strength earlier in the season. The proportion of old bees also appeared to be greater than in colonies with good queens. Both colonies died out during the winter of 1933-34.

The reason why some queens while still young and apparently vigorous lay both worker and drone eggs in worker cells has never been definitely determined. It seems natural to suspect insufficient insemination and this explanation has been advanced as a possible cause. The explanation is purely theoretical, however, as proof to support it has never been obtained. The fact that mated queens are more likely to become partial drone-layers after they have been shipped in mailing cages would seem to be adverse to this theory. Also W. J. Nolan in unpublished work found, by microscopical examination, that an artificially inseminated queen that layed only worker eggs in worker cells appeared to have received a comparatively small amount of semen. Likewise the cause of the death of the drone brood of partial-drone-laying queens as well as of laying workers and drone-laying queens has never been determined. In case of laying workers and drone-laying queens, improper nutrition, perhaps owing to the absence of young nurse bees, has been suggested as a possible cause. In case of partial-drone-laying queens, however, the drone brood dies even when young bees are present. More work on these questions seems to be desirable.

LITERATURE CITED

[1]Langstroth, L. L., and Dadant, C. P. 1927. The Honeybee. p. 51.
[2]_____. 1927. The Honeybee. p. 52.
[3]Root, E. R. 1935. ABC and XYZ of Bee Culture. p. 612.
[4]Watson, L. R. 1927. Controlled Mating of Queenbees.

THE BEE LOUSE

By ERNEST N. CORY
State Entomologist

For many years, particularly in the southern European section, the bee louse has been recognized as a pest of the hive bee, but relatively little accurate knowledge of its habits has been developed in the native habitat of this insect. It has been introduced into this country presumably with imported queen bees on a number of occasions, and was found in what seems to be in serious proportions in Maryland in 1920, and apparently the first record occurred in Minnesota in 1911. Mr. Nusbaum, in whose apiary it was found in 1920, reported that he had observed the insect at least five years previous to that date without knowing at that time its identity. It was found in Cumberland County, near Harrisburg, Pennsylvania in 1918 and again in 1923. In 1925 Mr. Argo found the insect either in the adult, or in the form of larval tunnels in honey from Allegany County, two points in Washington County, Prince George's County, Baltimore County, and many places in Carroll County. In the latter part of that year he found it in honey produced near Rochester, New York. During

the past summer Mr. Abrams has found the work of this insect in honey produced in Montgomery and Washington Counties.

Braula coeca, the technical name of the bee louse, is a wingless, reddish-brown insect about one-sixteenth of an inch long, with the body covered with numerous spine-like hairs. The legs are quite long in comparison with the body, and the last joint of each leg has a comb-like structure with 15 or 16 teeth on each side of the middle line of the tarsus. The insect clings to the hairs of the bee by means of these comb-like structures. The abdomen is considerably compressed and the whole insect is nearly round in outline, including the outstretched legs. The newly emerged adults are light tan in color.

In heavily infested colonies the lice may be found throughout the year in varying numbers. In early summer the lice appear to be more numerous on worker bees than on any other caste, but in late summer, or early fall, they may be found more numerously on queens than on workers.

The eggs may be found under the newly formed cappings on honey in the brood nests or in the supers. Argo reports that by tracing back tunnels to their beginning he found egg shells in each case glued lightly to the undersurface of the cappings slightly to the center as though the egg had been deposited there just prior to the completion of the cap. In addition to the empty egg shell, cast larval skins and pupal skins have been found throughout the tunnels. These tunnels have the same appearance as the very early larval tunnels of the wax moth. The presence of these tunnels, of course, throws any comb honey out of first grade. Whether the insect lives over winter in one of the immature stages, emerging early in the spring, or whether it lives over winter as an adult on the honey bees has not been definitely determined, but it would seem, from investigations of Argo, that the latter supposition is the more tenable since he failed to find any living material in the tunnels when the hives were first opened in the spring. Apparently gravid females were collected as early as May 16, but no larvae were found until June 12. This would seem to indicate that there was only one brood per year.

The feeding habits of the bee louse have been observed by several workers. The lice attach themselves to the hairs of the head near the upper lip and seems to tickle the labrum or upper lip of the host with the legs that are used in holding on to the hairs. In a short time the bee extends the tongue and the louse quickly moves forward so that it is able to place its mouth parts at the base of the bee's tongue just beyond the upper lip, and apparently sucks up such liquid as may be emitted by the bee. As soon as the bee louse has obtained a sufficient amount of the material excreted by the bee it returns to its position on the thorax.

The bee louse, therefore, is what is known as a commensal, rather than a parasite, as was supposed in the early days. Beekeepers and observers

generally are undecided as to whether the lice cause any economic loss in the death of bees or the queen. Some observers feel that the presence of large numbers of bee lice on the queens may lead to supersedure, but it may well be that a strong colony would be able to divest itself of these intruders and that a weak colony would suffer greater loss from the pest than the strong colony. It would seem reasonable at least that the presence of the bee louse might be a contributing factor in the loss of weak colonies, through death or supersedure of the queen.

There is no doubt that a considerable economic loss occurs in the production of comb honey where the pest is numerous, as the tunnels of the cappings disfigures the comb, throws it out of grade, and allows for leakage. Several methods of control have been suggested using chemicals on the bottom board, but it is very doubtful whether such materials could be used safely in sufficient concentration to cause the lice to release their hold on the bee without either killing some of the bees or causing them to leave the hive. In the event that an apiary becomes thoroughly infested, the wise procedure for the comb honey producer would be to extract all honey and render out the wax in the fall of the year, thoroughly scrape and sterilize the hives and start anew the following spring with package bees, secured from some source where the bee louse is known to be absent. There seems to be a tendency, in the north at least, towards this procedure as an annual practice to obviate the cost of packing, cellar wintering, and the consumption of at least forty pounds of honey necessary to carry the colony throughout the winter. The extraction of an extra forty pounds of honey in the fall would go a long way towards paying for the cost of new bees in the following spring. The disadvantage lies in the fact that all wax in the colonies would have to be rendered and the package bees would have to be started on new foundations and unfinished sections could not be used with safety in the brood chamber.

It is extremely doubtful whether a producer of extracted honey need concern himself very greatly about the presence of the bee louse, unless conditions get much more serious than they have ever been to our knowledge, in which event the same procedure advocated for the comb honey producer could be followed.

REPORT

OF THE

Maryland Vegetable Growers' Association

SEVENTEENTH ANNUAL MEETING

First Session

Wednesday, January 15, 1936

Baltimore, Maryland

The seventeenth annual meeting of the Maryland Vegetable Growers' Association was called to order with President W. N. Eyler in the chair at 10:00 A. M. at the Lord Baltimore Hotel, Baltimore, Maryland.

After greeting the assembly, the President introduced the first speaker, Dr. E. N. Cory of the University of Maryland.

SPINACH INSECTS

DR. E. N. CORY, State Entomologist
University of Maryland

There are relatively few insects that attack spinach, but at times these insects may determine the difference between profit and loss on a spinach crop. Fortunately there is rarely more than one insect species that attacks a crop at a given time. Probably the most important pest is the spinach aphis.

The Spinach Aphis,
Myzus persicae

This is the most common insect found upon spinach, but fortunately in this section it lives over in the egg stage on fruit trees belonging to the genus *Prunus*, such as peach, cherry, and plum. Consequently the early crop of spinach is seldom attacked to any serious degree because there is not time between the hatching of the overwintering egg and the cutting of the crop, for a heavy infestation to develop. This insect is a light green plant louse and lives on the undersides of the leaves. It is nearly 2 mm. in length when mature, or approximately 1-12 of an inch. The general color is light green with variations running to greenish-white and yellowish-green. The eyes are red. The first generation that hatches from the egg is known as the stemmother and she produces living young with-

out fertilization. This process is continued for approximately three generations and then winged females are produced that migrate to a very large number of plants. Over one hundred host plants have been noted for this pest. In addition to spinach, it does economic damage to kale, potatoes, and peach buds. The winged adults continue to produce living young without fertilization, but during the hot summer months the pest practically disappears from cultivated plants. It reappears in September, usually on kale first, and later on spinach. In the fall the insect may be so abundant upon spinach as to require repressive measures.

Heretofore, dusting and spraying of spinach and kale has been advised. Spraying of kale, however, costs in the neighborhood of $3.50 per acre, where nicotine sulphate and fish oil soap is used on crops planted in rows twenty inches apart. A much more sensible procedure seems to be to wash the spinach in a solution of pyrethrum, 1-1000, to which has been added an efficient spreader such as soap, blown castor oil, or sulphated alcohol, followed by rinsing, to free the plants of any pyrethrum residue. This operation can be carried out at a cost of approximately 2½ cents per basket, for the insecticide. Several growers used this method this year and it has been practiced previously in the Norfolk section.

Washed and iced spinach goes to the market in a very much more attractive form and should command a higher price than the unwashed spinach. Even with a small infestation of one or more aphids per plant, there is a tendency for the aphids to migrate from the bottom of the basket to the upper layers and collect on the cover so that the buyer invariably sees the aphid infestation as soon as he opens the package. There is nothing poisonous about pyrethrum, even if any of it remains after the rinsing process. Therefore, this practice should be followed in all cases where there is an infestation late in the season if it has not resulted in a loss in the crop. In case the infestation begins to develop early in September in such proportions as to threaten the life of the plants, spraying or dusting with nicotine should be practiced. A 3 per cent. nicotine dust, or a solution of 1-800 with four pounds of soap to fifty gallons should be employed.

Spinach Leaf-Miner,
Pegomyia hyoscyami

The injury in this case is done by a maggot that burrows between the two surfaces of the spinach leaf causing a blotch mine. The larvae hatch from eggs that are laid on the under surface of the leaves in neat rows, up to as many as eight eggs per leaf. The egg is white and heavily reticulated. The maggot feeds until it is about one-third of an inch in length, and it requires from fifteen to seventeen days to complete its development. The egg stage lasts four days. Upon completion of its feeding the larva goes into the ground and forms a brown pupa. It stays in this stage between fourteen and twenty days

during the growing season, and then emerges as a small gray fly that looks very much like the house fly, but is considerably smaller. This insect is also a feeder on Chenopodium and Amarantus. Several weeds belonging to these genera are infested, but the commonest ones infested are lamb's quarters and pig weed, or red root. Control of these two weeds in early spring will help to reduce the possibility of infestation in the early crop, as the weeds are usually infested prior to the infestation of spinach. Continuous warfare against these two weeds throughout the summer will reduce the possibility of infestation in the fall crop, although in this area the fall crop is seldom attacked, probably due to the aestivation of the pupal stage during the summer. This same pest has been controlled on beets in Russia by spraying with barium chloride, but it hardly seems desirable to advocate spraying for the control of the spinach leaf-miner when cultural practices will do so much toward preventing an infestation.

The Spinach Flea Beetle,
Disonycha xanthomelaena

This insect is black with a reddish-yellow thorax, or collar. The first generation is produced on lamb's quarters or chick weed, and the second generation attacks spinach and beets. The young, or larvae, also feed upon the plant. They can be controlled by dusting whenever they become a serious menace, but ordinarily they are not present in serious enough numbers to warrant dusting or spraying. Owing to the ban on arsenical residue it will probably be better to use a pyrethrum spray.

The Hawaiian Beet Webworm,
Hymenia fascialis

The eggs of this species are very small and are deposited singly, or in short rows on the lower surface of the leaves. The caterpillars are small, slender, pale yellowish-green, frequently under a web which they spin over themselves. They attain the full length of about ¾ of an inch, then enter the ground and form an oblong earthen cocoon, from which emerges a moth with a wing expanse of nearly one inch in length, dark brown with a broad translucent bar across the wing and a white bar halfway across the wing near the apex of the wing. This is normally a sub-tropical insect that usually makes its appearance late in the fall. In the early part of the fall they feed on the leaves, making them unsightly, and as winter approaches they are inclined to feed in the heart of the plant.

These larvae can be controlled by dusting with a poison mixture, but it would probably be better to use pyrethrum in this case, as in that way you will avoid any arsenical residue. The insect also feeds on the same weeds as the spinach leaf miner, as well as upon purslane, which is commonly called by the colored folks, "pussley." Eradication of such weeds will go a long way towards preventing depredation of this pest.

DEVELOPMENT OF DISEASE RESISTANT VARIETIES OF TOMATOES

By WM. S. PORTE, Assistant Pathologist, Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture

Introduction

The development of varieties of tomatoes which resist diseases that exact a heavy toll from tomato growers each year has been the goal of forward-looking pathologists and horticulturists for several decades. In 1908 Prof. Norton, of the University of Maryland, in an address before the Peninsular Horticultural Society, stressed the possibilities and advantages of controlling diseases by the development of resistant varieties. We acknowledge with due credit, the progress which has been made in the development and improvement of materials and methods of control by the use of chemical sprays and dusts; nevertheless it must be recognized that however effective these control measures may be, they entail extra labor and expense and it is practically impossible to secure their effective application to the entire crop. Furthermore, they are quite ineffective in controlling systemic diseases such as wilt and mosaic or other virus diseases. Therefore, the development of tomato varieties resistant or immune to destructive diseases is of vital importance to everyone interested directly or indirectly in the growing of the crop.

A Brief Survey of the Problems Involved

Before discussing the breeding work already accomplished in this field and the work in progress, it would be well to briefly survey the general problems involved in breeding for disease resistance in order that we may understand why we cannot produce varieties resistant to various diseases as rapidly and as effectively as we would like to do.

The breeder cannot develop a wilt resistant tomato variety unless he first discovers a plant having some capacity for resistance to wilt in its germplasm so it can transmit this character to its offspring. Despite the notable work that has been accomplished in developing resistant plants, the breeder can only discover and isolate qualities or characters which are already present (sometimes evident and sometimes obscure) in the breeding stocks with which he is working. After finding the desired characters, the breeder must superintend the process of developing breeding stocks that are uniform for these characters. If these uniform, selected lines are not good commercial varieties it is then necessary to use them as parents in making crosses with varieties having the desired commercial qualities, in efforts to combine the disease resistance of one variety with other superior traits of another. Then the hybrid material must be carefully

selected and these selections tested to insure that they breed true for the desired combination of characters. This is slow, time consuming work since many generations involving thousands of plants must usually be grown before the desired combination of characters has been obtained and fixed in a varietal type which will continue to breed true for vine and fruit type and disease resistance.

The successful breeding of disease resistant tomatoes is dependent, then upon 3 main points: (1) one must find a tomato variety or closely related species with which tomatoes will hybridize, that is resistant or immune to the specific disease the breeder seeks to control. This sometimes necessitates the introduction and testing of all known tomatoes and related species, the search for resistant plants extending to the remote corners of the world. (2) When a resistant plant has been discovered, unless it happens to have the desired type and productiveness, it must be crossed with a selected tomato having the desired qualities lacking in the resistant plant. (3) The elimination of the undesired characters and the recombination and fixing of the desired characters in one of the progeny lines must be successfully effected. Without repeated tests under controlled conditions there is no way of knowing whether a plant remaining healthy in a disease-infested field is really disease resistant or whether it has merely by chance escaped the disease. Furthermore, it may not be pure for the factor of disease resistance, and thus may produce both resistant and susceptible progeny. For these reasons all apparently resistant plants must be repeatedly tested under conditions favorable for the development of the disease. In the case of Fusarium wilt this necessitates testing the lines of tomatoes in soil infested with the fungus producing the disease.

The degree of improvement in resistance that may be obtained by selection and testing within any given variety is dependent upon the range of resistance existing within this variety, and this in turn is dependent upon the genetic makeup of individuals included within the so-called variety. For example, the varieties Stone, Greater Baltimore, and Marvel of the Market possessed a much wider range of wilt resistance than other varieties tested, but the Duke of York and Globe selection exhibited small differences of resistance. Whenever the genetically uniform individual types within a so-called variety have been separated and isolated as pure lines by inbreeding and selection, no further improvement can be obtained by continuing selection. Resistance is apparently as permanent as any of the other characteristics of a tomato variety. Of course, it must be recognized that in breeding tomatoes for disease resistance, we are dealing with two groups of living organisms, the tomato plants and the parasites causing the disease, both of which can vary in their characteristics, thus further complicating the development of resistant tomato varieties.

With this outline of the problem before us we shall now consider some

of the breeding work in developing disease resistant tomato varieties already accomplished.

Tomato Breeding for Disease Resistance Already Accomplished

The pioneer work in breeding tomatoes for disease resistance was started about 1910 by workers in several state experiment stations including Prof. Norton of Maryland, Prof. Essary of Tennessee, and Dr. Edgerton of Louisiana. Healthy plants were selected from fields in which most of the other plants were dying from the results of Fusarium wilt infections. Comparative tests were made of the relative resistance of the plants grown from each of the original selections and only those showing the most resistance were saved for further tests and ultimate multiplication of the most uniformly resistant and productive line. "Louisiana Wilt Resistant," a resistant selection from Acme and "Tennessee Resistant" selection from Beauty were among the first wilt resistant sorts developed in this manner.

The program of the U. S. Department of Agriculture for the breeding of disease resistant tomato varieties was started in 1915 by the late F. J. Pritchard. All available domestic and foreign varieties were collected and tested for resistance to wilt. Included in the group were some field selections of Stone made by Prof. J. B. S. Norton and it was from a single resistant plant found in these Stone selections that the first wilt resistant variety, introduced by the Bureau of Plant Industry in 1917, was developed and named Norton. It is a good late wilt resistant canning variety of the Stone type and is still used as a standard sort in some places. In 1918, Columbia, a wilt resistant selection from Greater Baltimore, and Marvel, a wilt resistant selection from Marvel of the Market, were released to the tomato industry by the United States Department of Agriculture. During this time the Louisiana Experiment Station released two wilt resistant varieties called Louisiana Red and Louisiana Pink which were selections from crosses made between Louisiana Wilt Resistant and Earliana.

In the meantime the program of crossing selected plants from tested progenies was under way in the Department. Hundreds of crosses were made and tested and all except a few were discarded. However, from the few retained numbers, a group of varieties of various types and suitable for a varying range of conditions and purposes has been developed and introduced by the Department. All are resistant to Fusarium wilt, and most of them are also resistant to nail head rust of the fruit. Included in this group are,—Norduke, a cross between Norton and the Duke of York, a heavy vined wilt resistant late canning variety; Marvana, a cross between Marvel and Earliana, a wilt and nail head rust resistant early market tomato of the Earliana type; and Marvelosa a cross between Marvel and Ponderosa, a wilt and nail head rust resistant, pink fruited variety suitable for late marketing.

Probably no tomato variety has been more widely used than Marglobe, released by the Department in 1925, because of its wilt and nail head rust resistance, coupled with its productiveness and good fruit type which is suitable for canning, for local marketing, for shipping, and for a large forcing variety. Break o'Day, a cross between Marglobe and Marvana, is particularly useful where the growing season is rather cool. It is wilt and nail head rust resistant, and is an open vined, early market variety producing medium large red fruits. Since the fruits are not amply shaded by the small leaved scanty foliage, they are apt to develop poor color during hot weather. The variety called Pritchard, a wilt and nail head rust resistant sort, was developed from a cross between Marglobe and Cooper Special, and released by the Department in 1932. It is now widely used as a local market, as a shipping tomato, and, also, as an early canning and juice making variety.

The new wilt and nail head rust resistant shipping tomato, Glovel, was developed, cooperatively by the United States Department of Agriculture anl the Florida Experiment Station, from a cross between Marvel and Globe and released in 1935. The primary purpose in developing this variety was to produce a "pink" fruited shipping variety having the disease resistant characteristics of Marvel combined with the fruit qualities of Globe for markets and consumers that prefer a "pink" fruited variety.

A selection of Marvel was chosen as one of the parental stocks because it had been discovered by tests that it not only was highly resistant to wilt but also that it was practically immune to nail head rust of tomato fruits. However, the fruit characters of Marvel were undesirable for a shipping variety, being too small and flat, of scarlet instead of scarlet red color, and not sufficiently solid. Therefore different fruit characters had to be combined with the disease resistance of Marvel to obtain a desirable variety. A selection of Globe was chosen to furnish the desired characters other than disease resistance because it produced large thick walled "pink" globular fruits. However, it was somewhat susceptible to wilt and was very susceptible to nail head rust. Therefore these characters had to be eliminated from the new variety. The real worth of the new variety remains to be determined by extensive tests in the hands of practical tomato growers.

In addition to the disease resistant varieties already mentioned the Kansas Station developed Kanora, a wilt resistant variety resulting from a cross between Norton and John Baer. The Illinois Experiment Station developed two wilt resistant forcing varieties from a cross between Louisiana Pink and Grand Rapids Forcing. The red fruited selection they named Lloyd Forcing and the pink fruited one, Blair Forcing. The Michigan Station has recently introduced Michigan State Forcing, a wilt resistant variety developed from a cross of the English variety Ailsa Craig and Marglobe.

Tomato Breeding for Disease Resistance Now in Progress

The production of disease resistant tomato varieties markedly superior to those already developed will require the employment of more refined methods than were used in developing the first disease resistant varieties in order to assure success. The closer cooperation of the plant explorer, plant pathologist, plant physiologist and plant breeder will become increasingly effective in carrying this work forward. The explorer's work is necessary in locating and assembling all available tomato parent stocks from the four corners of the world. The pathologist is essential in studying the causal agents of diseases and in determining the response of the assembled breeding stocks to the various tomato diseases. The physiologist's help may also be needed here in determining physiological relationships between host plants and parasites. The breeder must find out something about how the various factors with reference to disease resistance, and fruit and vine characters of the parent stocks are inherited so that he can obtain the desired combination of characters in new varieties in the most efficient manner. It is possible for one worker to attempt to accomplish all phases of breeding for disease resistance alone, but it is a rare person who can encompass all phases of the work with most success. Therefore, the present organization of the Division of Fruit and Vegetable Crops and Diseases is designed to facilitate the cooperation of trained specialists in all phases of these many sided research problems.

We are now working with several hundred tomato seed stocks collected from all over the world. In addition to these we have collected from various sources over fifty lines of the Marglobe variety. All of these seed stocks have been carefully inbred for one to three generations and will be tested for resistance to various tomato diseases. At present we are endeavoring to isolate a tomato line which will prove to be immune to wilt, and to find out how the immunity is inherited. Among the inbred lines developed from commercial Marglobe stocks tested last season four lines were very susceptible to invasion by wilt, nine were apparently entirely free from wilt infection, and the others exhibited varying degrees of infection. Regardless of infection, all these lines were definitely resistant, but some were more so than others. Out of 315 miscellaneous inbred stocks 102 were very susceptible, six were free from infection and the other numbers showed intermediate degrees of susceptibility and resistance. Selected immune and susceptible lines are now growing in our greenhouses for further inbreeding and for crossing. One of the immune stocks is the so-called currant tomato, a species usually considered distinct from the common tomato. It is planned to make some interspecific crosses between this resistant line and both resistant and susceptible numbers of standard tomato types for the purpose of studying the inheritance of resistance and the possibility of developing superior commercial types from such crosses.

Our pathologists are also testing tomato stocks for resistance to various tomato mosaic viruses. Thus far no plant has been found which has shown any marked resistance.

On the Pacific Coast, where Verticillium wilt causes more damage than Fusarium wilt, Department workers are cooperating with the State workers to breed tomato varieties resistant to Verticillium wilt and to curly top, a virus disease. Tomato lines resistant to Verticillium wilt have been developed and they are now working to obtain and to fix a desirable commercial type.

Searching for resistance to curly top and to spotted wilt, two most serious tomato virus diseases over certain areas of the West, is now in progress in California. Although dwarf varieties have been shown to be slightly resistant to curly top, there have not as yet been developed standard types that are resistant under severe infestations of leaf hoppers which transmit the disease.

The possibility of control of tomato leaf mold through varietal resistance has been studied by several institutions, and considerable progress has been made in breeding varieties resistant to this fungus disease by the Ohio and Massachusetts experiment stations and by the Kaiser Wilhelm Institute in Germany. A few commercial varieties tested, including Norduke, have shown partial resistance to the disease. However, most progress in breeding resistant varieties has been made by crossing selected plants with the highly resistant currant tomato. By repeated back crossing to the susceptible larger fruited parent plants, the disease resistance of these smaller fruited resistant hybrids has been transmitted, and lines developed that have good fruit and vine characters as well as resistance. This indicates the probability that breeders will be able to combine the resistance to other diseases found in commercially worthless plant types with desirable commercial characters.

Since resistance is often found in plants that are worthless commercially, it greatly retards the development of commercially valuable varieties resistant to these diseases, but this fact should cause us to increase our interest and to redouble our efforts in overcoming these difficulties.

TRUCK TRANSPORTATION OF FRUITS AND VEGETABLES IN WESTERN MARYLAND

By RALPH RUSSELL,

Assistant Professor Agricultural Economics
University of Maryland

In this talk I plan to give you some facts concerning the volume of fruits and vegetables shipped by truck from certain areas in Maryland. I shall indicate the type of trucks used and the cost of operating them. I shall also present some data as to the conditions under which the produce is marketed in Baltimore and Washington.

While this material has a close bearing on the problems of our city produce markets and the men who supply them, I shall not go into these problems to any great extent. When additional phases of the study have been completed, we shall be able to speak more concretely. For the time being, I shall have to leave you to make your own application of the facts, which should at least prove interesting. So far as I know, this is the first comprehensive attempt to show the cost of transporting fruits and vegetables by motor truck. The study was conducted in nine northeastern States from North Carolina to Massachusetts. It was initiated by the Farm Credit Administration, and the experiment stations of nine States took part, with the assistance of Professor Rasmussen of Cornell.

The figures I am discussing were gathered from 189 fruit and vegetable growers in three areas of Maryland west of Chesapeake Bay. The schedules covered operations from July 1, 1933 to July 1, 1934 and were, in most instances, estimates rather than matters of record. In the area about Baltimore we took records from 90 growers; 34 in Anne Arundel County, 41 in Baltimore County, 9 in Harford, 5 in Carroll, and 1 in Howard. The 60 records from growers in the Washington, D. C. area came chiefly from Prince George's and Montgomery Counties, 45 from the former, 12 from the latter. We also gathered data from 39 growers in Washington County covering the apple and peach regions in both the eastern and the western parts of the county, with some attention to the producers of raspberries and lima beans which are found only in the eastern area. .

We obtained 280 records on the southern Eastern Shore also. These are being worked up at Cornell in conjunction with some 3,000 other records from the other States. The Western Maryland records have been handled by Mr. R. W. Lennartson, a graudate student in our department. He has prepared the data which I am reporting, and is here to help answer questions.

The records on which my talk is based are, of course, only a sample but from them we can discover the conditions under which truck transportation is carried on. The data, while representative, report only a

small percentage of the total business in fruits and vegetables that originates in these areas. For example, it appears that over $3,000,000 of produce is sold on the Marsh Market in Baltimore annually. Our records cover about $285,000 of this or less than 10 per cent.

The 189 farms included in this survey had 17,547 acres of crops, of which 4,882 were in vegetables, 3,987 in tree fruits, and 96 in berries. Table 1 gives the volume of produce marketed from these farms, and the percentage of the total tonnage represented by each crop. You will see

Table 1. Tonnage of Various Fruits and Vegetables Marketed by 189 Western Maryland Growers, July 1, 1933-July 1, 1934

Crop	Tons	Per Cent. of Total Tonnage
Apples	2,967	13.6
Spinach	2,540	11.7
Tomatoes	2,531	11.7
Peaches	2,145	9.9
Cantaloupes	1,784	8.2
Cabbage	1,738	8.0
String Beans	1,364	6.3
Sweet Potatoes	1,293	6.0
Potatoes	1,125	5.2
Sweet Corn	856	3.9
Kale	434	2.0
Turnips	320	1.5
Rutabagas	320	1.5
Beets	252	1.1
Peppers	247	1.1
Squash	225	1.0
Cucumbers	204	1.0
Strawberries	202	1.0
Other crops	1,145	5.3
Total	21,692	100.0

that apples and spinach lead the list, followed by tomatoes, peaches, cantaloupes and so on. If we had included two records from abnormally large farms; one a group of fruit farms operated as a unit, and the other the record of the largest operator on Patapsco Neck, this list might have looked considerably different. In order to avoid the bias which these unusual records might have given our figures, we omitted them.

Tables 2, 3, and 4 give similar tonnage figures, together with total values for three areas separately. There are a number of additional calculations, the main purpose of which is to show the cost of marketing as a percentage of total value. Note that the cost of marketing was nearly 30 per cent. of the gross value in the Baltimore area, and that it ran over 25 per cent. in both the Washington, D.C., area and the Washington County region. I shall revert to these figures later.

Table 2. Tonnage, Value and Cost of Marketing Fruits and Vegetables for 90 Growers in the Baltimore Area, 1933-34

Crop	Rank	Tons Sold	Per Cent. of Total Tonnage	Gross Value	Per Cent. of Total Gross Value	Cost of Marketing	Per Cent. of Gross Value	Net Value	Per Cent. of Gross Value
Spinach	1	2,355.0	20.0	$42,907.50	15.1	$12,332.24	28.7	$20,575.26	71.3
Tomatoes	2	1,801.9	15.4	42,886.50	15.0	13,563.40	31.6	29,323.10	68.4
Cantaloupes	3	1,363.2	11.6	38,733.00	13.5	12,407.60	32.0	26,325.40	68.0
String Beans	4	1,268.1	10.8	33,734.50	11.8	8,742.21	26.0	24,992.29	74.0
Cabbage	5	1,085.8	9.2	15,506.50	5.4	6,454.20	41.6	9,052.30	58.4
Sweet Potatoes	6	809.0	7.0	21,724.00	7.7	6,672.60	30.7	15,051.40	69.3
Potatoes	7	727.1	6.2	20,636.50	7.2	5,137.57	25.0	15,799.43	75.0
Peaches	8	416.0	3.5	13,342.50	4.8	2,523.50	19.0	10,819.00	81.0
Sweet Corn	9	362.4	3.1	7,984.20	2.8	2,247.70	28.2	5,736.50	71.8
Rutabagas	10	204.3	1.7	3,225.00	1.1	787.60	24.4	2,437.40	75.6
Turnips	11	156.7	1.3	2,325.00	.8	1,080.26	46.5	1,244.74	53.5
Cucumbers	12	154.8	1.3	3,934.70	1.4	1,471.30	37.4	2,463.40	62.6
Beets	13	114.4	.9	2,342.00	.8	575.90	24.6	1,766.10	75.4
Strawberries	14	112.3	.9	7,699.00	2.7	2,679.10	34.8	5,019.90	65.2
Asparagus	15	101.8	.9	10,230.00	3.6	901.50	8.8	9,328.50	91.2
Peppers	16	89.0	.8	2,703.00	.9	1,095.12	40.5	1,607.88	59.5
Egg Plant	17	51.9	.4	2,270.00	.8	873.50	38.5	1,396.50	61.5
Onions, green	18	48.8	.4	2,168.00	.7	377.80	17.4	1,790.20	82.6
Lima Beans	19	44.7	.3	2,259.00	.7	470.75	20.8	1,788.25	79.2
Miscellaneous	....	501.6	4.3	8,975.00	3.2	3,479.52	38.8	5,495.48	61.2
Total	....	11,770.8	100.0	$285,585.90	100.0	$83,883.37		$201,702.53	
Average							29.4		70.6

Table 3. Tonnage, Value and Cost of Marketing Fruits and Vegetables for 60 Growers in the Washington Area, 1933-34

Crop	Rank	Tons Sold	Per Cent. of Total Tonnage	Gross Value	Per Cent. of Total Gross Value	Cost of Marketing	Per Cent. of Gross Value	Net Value	Per Cent. of Gross Value
Tomatoes	1	728.8	12.6	$22,847.00	13.8	$5,810.43	25.4	$17,036.57	74.6
Cabbage	2	652.0	11.2	10,171.50	6.2	3,107.70	30.6	7,063.80	69.4
Apples	3	503.7	8.6	18,500.00	11.1	8,636.50	46.7	9,863.50	53.3
Sweet Corn	4	493.2	8.5	12,008.00	7.3	2,455.90	20.5	9,552.10	79.5
Sweet Potatoes	5	484.7	8.4	11,924.50	7.2	3,227.57	27.0	8,696.93	73.0
Cantaloupes	6	421.2	7.3	11,187.50	6.7	3,074.89	27.5	8,112.61	72.5
Potatoes	7	395.9	6.8	12,465.30	7.5	2,642.38	21.2	9,822.92	78.8
Kale	8	345.5	6.0	8,471.00	5.3	2,436.78	28.8	6,034.22	71.2
Squash	9	189.3	3.3	4,039.50	2.4	1,165.38	28.8	2,874.12	71.2
Spinach	10	184.8	3.2	5,655.00	3.4	1,462.01	25.9	4,192.99	74.1
Turnips	11	163.1	2.8	3,865.00	2.3	721.82	18.7	3,143.18	81.3
Peppers	12	158.1	2.7	3,891.00	2.4	1,165.79	30.0	2,725.21	70.0
Peaches	13	138.5	2.4	5,095.00	3.1	1,114.10	21.9	3,980.90	78.1
Beets	14	137.9	2.4	3,802.00	2.3	652.29	17.2	3,149.71	82.8
Rutabagas	15	115.4	2.0	2,215.00	1.3	460.80	20.8	1,754.20	79.2
String Beans	16	95.6	1.6	4,009.70	2.4	1,098.75	27.4	2,910.95	72.6
Strawberries	17	90.0	1.6	7,301.00	4.4	2,199.90	30.1	5,101.10	69.9
Lettuce	18	55.2	.9	2,258.00	1.4	595.31	26.4	1,662.69	73.6
Miscellaneous	....	449.3	7.7	15,731.00	9.5	3,294.92	21.0	12,436.08	79.0
Total	....	5,802.2	100.0	$165,437.00	100.0	$45,323.22		$120,113.78	
Average							27.4		72.6

Table 4. Tonnage, Value, and Costs of Marketing Various Fruits and Vegetables for 39 Washington County Growers, 1933-34

Crop	Rank	Tons Sold	Per Cent. of Total Tonnage	Gross Value	Per Cent. of Total Gross Value	Cost of Marketing	Per Cent. of Gross Value	Net Value	Per Cent. of Gross Value
Apples (all grades)	1	2,431.4	59.0	$84,857.00	56.8	$21,245.40	25.0	$63,611.60	75.0
Peaches	2	1,591.0	38.6	55,018.00	36.8	14,194.40	25.8	40,823.60	74.2
Raspberries	3	45.6	1.1	4,918.20	3.3	1,441.64	29.3	3,476.56	70.7
Lima Beans	4	14.9	.4	2,585.90	1.7	337.96	13.0	2,247.94	87.0
Miscellaneous	....	36.4	.9	2,122.30	1.4	515.69	24.3	1,606.61	75.7
Total	....	4,119.3	100.0	$149,501.40	100.0	$37,735.09		$111,766.31	
Average							25.2		74.8

The percentage of the total tonnage which went by truck and otherwise is shown in Table 5. In the Baltimore area 98.6 per cent. was hauled in the growers' own trucks and an additional 1 per cent. by hired trucks. Thus, all, except for an insignificant amount sold at the farm, was carried by truck. In the Washington, D. C. area, hired trucks played a more important part, carrying 7.1 per cent. of the produce. Otherwise, the picture is much the same.

Table 5. Types of Transportation Used in Marketing Fruits and Vegetables by Growers in Three Areas of Western Maryland, July 1, 1933-June 30, 1934

Types of Transportation	AREAS					
	Baltimore		Washington		Washington Co.	
	Tons Marketed	Per Cent. of Area Tonnage	Tons Marketed	Per Cent. of Area Tonnage	Tons Marketed	Per Cent. of Area Tonnage
Grower's own truck	11,604.7	98.6	5,309.3	91.6	837.7	20.3
Truck hired by grower	116.0	1.0	410.7	7.1	1,220.0	29.6
Miscellaneous	6.4	....	26.0	0.4	126.8	2.1
Sold at farm	43.8	0.4	56.2	0.9	1,934.8	47.0
Total	11,770.8	100.0	5,802.2	100.0	4,119.3	100.0

It seems to be generally conceded that trucks have a monopoly of the short haul in perishable commodities, if not in all comodities. So, it is not surprising to find this the case with produce in the areas where the growers' average distance from market is 15 miles for Baltimore and 12.4 miles for Washington. But how about Washington County where the farms studied averaged over 75 miles from the market in which the produce was sold? We certainly have another picture there.

In the first place, there is a great deal of fruit sold at the farm in this region, so that 47 per cent. of the produce recorded was disposed of in that way. Of the more than 50 per cent. of the produce which was moved by truck, however, hired trucks carried more than was hauled by growers in their own trucks. It should be noted that although 50 per cent. of this produce left the farm by truck, at least 20 per cent. of the total tonnage of the area or 40 per cent. of that which moved by truck, traveled by truck only as far as the local railroad station. While I do not have the evidence at hand to demonstrate it, I think it can be shown that most

of this short distance hauling was done in the grower's own truck. This means that the percentage that was hauled a long distance by hired trucks was much greater than appears from our figures. This conclusion is in line with results from other parts of the study which show that beyond 50 miles from market, relatively little produce is hauled by the grower in his own truck. Really long distance hauling is relatively small in amount, and the growers more than 50 miles from market tend to hire their produce hauled.

Long distance hauling gets a lot of notice because it is spectacular. Celery is regularly brought north from Sanford, Florida, in refrigerated trucks, and we see other produce brought from Florida and Georgia. Nevertheless, the volume hauled such distances is relatively small, even that carried by commercial truckers. Only 106 carloads reached New York City from Florida by truck in 1934. This was about one-third of one per cent. of the 32,877 carloads shipped from Florida to New York. Of the Georgia shipments only one-half of one per cent. went by truck. Reports from 247 commercial truckers in the nine States covered by our survey showed that less than one per cent. of the fruits and vegetables they hauled traveled over 450 miles. A little over two per cent. was carried 300 to 450 miles, 17 per cent. was hauled 150 to 300 miles, while about 74 per cent. was hauled 50 to 150 miles. Under 50 miles, most of the hauling was done by the growers themselves.

Cost of Marketing

The number of trips to market made by 158 growers is given in Table 6. They averaged 107½ trips each, with an average load of about 1 ton. As would be expected, a heavy concentration of the business in the summer months is shown. Sixty-five per cent. of the trips were made in the four months June, July, August, and September. The addition of the October trips gives 75 per cent., while the six months, May through October, covered 82 per cent. of the trips. In the four months of least business only 7 per cent. of the market trips were made.

Table 6. Distribution of Market Trips by Months—158 Growers in Western Maryland—July 1, 1933, to June 30, 1934

Month	Number of Trips	Per Cent. of Total
July	3,004	17.5
August	3,411	20.0
September	2,530	14.8
October	1,718	10.0
November	1,077	6.3
December	572	3.4
January	222	1.2
February	175	1.1
March	282	1.6
April	766	4.5
May	1,181	6.9
June	2,153	12.7
Total trips	17,091	100.0

The record of time spent in marketing revealed the startling situation shown in Table 7. I am inclined to think these figures on time lost in the market are somewhat exaggerated due to the time at which they were obtained. Most of these records were taken during the height of the season when growers were compelled to spend more time due to the great volume of produce clogging the markets. They were perhaps inclined to be influenced by the long hours they were then spending in the market and didn't give full weight to the time at the beginning and end of the season, when there was less delay. I am not sure that this occurred, but it is a possibility which should be mentioned. Most of the produce, of course, goes on the market during the rush season so the growers' estimates may not be so far off.

Notice how small a proportion of the time consumed in marketing was spent on the road. This is especially noticeable in the first column covering sales on the Marsh Market. Our produce market facilities have failed to develop as rapidly as motor truck transportation. What better reveals the congestion at an outgrown market than the fact that those who sold on the Marsh Market arrived on the average, four hours ahead of selling time in order to obtain a favorable location. An hour and a half wait for sale of the produce and an hour and three-quarters waiting to unload at the buyer's place of business also went to make up the 8¼ hours spent in the city for each load of produce marketed.

The ten hours per load spent in marketing at the Marsh Market is equalled by the time spent marketing direct at the Washington Union Market. Here, the long hours are due chiefly to waiting for buyers rather than to congestion. The 12 hours per trip spent by Washington County

Table 7. Average Time Spent Per Trip Marketing Motor Truck Shipments of 144 Western Maryland Growers, by Areas, July 1, 1933, to June 30, 1934

Item	Baltimore Area				Washington Area				Washington Co.	
	Marsh Market		Camden Street Market		Union Market Commission Sales		Union Market Wholesale Sales		All Markets	
	Hours	Per Cent.	Hours	Per Cent.	Hours	Per Cent.	Hours	Per Cent.	Hours	Per Cent.
Average time per trip	10.06	100.00	3.50	100.00	3.14	100.00	10.09	100.00	11.99	100.00
Farm to market	.89	8.84	1.00	28.56	.76	24.27	.94	9.33	4.43	36.98
Wait for market opening	4.05	40.23	.....	.....	.....	.....	.....	.....	.30	2.50
Wait for selling	1.59	15.85	.44	12.49	.75	23.89	7.76	76.85	1.36	11.30
Wait for unloading berth	1.78	17.70	.44	12.49	.26	8.37	.07	.74	.64	5.28
Unloading	.64	6.37	.56	16.09	.56	17.55	.33	3.30	.72	6.03
Delay from street congestion	.19	1.92	.06	1.80	.05	1.65	.05	.45	.11	.93
Other delays	.03	.25	.....	.....	.....	.....	.....	.....	.....	.....
Return, market to farm	.89	8.84	1.00	28.57	.76	24.27	.94	9.33	4.43	36.98
Total, except to and from market	8.28	82.32	1.50	42.86	1.62	51.46	8.21	81.33	3.12	26.04

growers was largely consumed in actual driving to reach their distant markets and return from them. It will be seen that selling through commission merchants saved a great deal of time on both Baltimore and Washington markets.

I was interested to guess at how much was gained by those who spent long hours in marketing their goods through the Marsh Market. I could not get a satisfactory answer, but I made this calculation. Prevailing commissions on the Marsh Market were 5 per cent. On the Camden Market, commission merchants charged 10 per cent. If the grower could save 5 per cent. commission by spending 6¾ hours more per trip in selling on the Marsh Market he is paid 19½ cents per hour for the time. That is, 5 per cent. of the value of the average load of produce marketed in Baltimore by these growers would amount to 19½ cents for each hour of extra time consumed in selling through the Marsh Market. This calculation shouldn't be taken seriously as it assumes equal prices in the two markets and many other things that probably are not so. Nevertheless, it doubtless has some value as an indication of what a careful comparison might show.

The Experiment Station has already done some work in investigating the Baltimore fruit and produce markets and has proposed a comprehensive survey of the situation. If this project is approved we shall have on its completion, a detailed account of the present facilities and practices and their shortcomings.

I want to show you the selling costs reported, before taking up truck costs in detail. The total selling costs for each crop in each of the three areas are given in Tables 2, 3, and 4.

Table 8. Selling Costs, Gross Value, and Net Value of Fruits and Vegetables Sold by 189 Western Maryland Growers, 1933-34

Item	Amount	Per Cent. of Total Marketing Costs	Per Ton Cost and Value
Sales fees	$26,833.00	16.1	$1.24
Transportation	45,456.88	27.2	2.09
Containers	63,613.20	38.1	2.93
Market costs*	25,624.90	15.4	1.18
Other costs†	5,411.30	3.2	.25
Total selling costs	$166,941.68	100.0	$7.69
Net Value	$433,582.62	.....	$19.99
Gross value	$600,524.30	.....	$27.68

*Covers time spent on market, stall rentals, etc.
†Storage charges.

Table 8 shows total selling costs for all three areas of $166,941.68, or 27.8 per cent. of the sale value of $600,524.30. You will note that while transportation is 27.2 per cent. of the selling costs, containers are a larger item, running 38.1 per cent. This percentage would be smaller where markets were more distant. Remember the average haul was only 15 miles, so that transportation costs were low. Market costs consist primarily of time spent on the market, but may also include stall fees and the like. In the last column the costs and values are given in terms of dollars per ton.

We have reports on 168 trucks owned by 148 fruit and vegetable growers in Western Maryland. These trucks were predominantly Fords and Chevrolets. Over 100 were of these makes and 100 were 1½ tons trucks, though the range of rated capacity was from ½ to 3 tons. The average load hauled varied from 1/10 of a ton to 3.7 tons. While the average age of these trucks was 5¾ years, they ranged from new trucks to a veteran Ford of 17 years. Values ranged from $8 to $1,650, while the average was $250.

The usual length of haul on which these trucks operated varied from 3 to 75 miles and averaged 15 miles. The total yearly mileage ranged from 350 to 30,000 and averaged 5,634. The annual mileage covered by the trucks in hauling fruits and vegetables ranged from 350 to 6,800 and averaged 2,929. The cost per ton-mile, excluding labor and board charges, ranged from 1.4 cents to more than $2.28 and averaged 13.02 cents. This average cost is extremely high as compared to that shown by the commercial truckers who, of course, are ordinarily operating over longer distances. As I recall it, the average cost per ton-mile of the bulk of the commercial truckers in 9 States, as calculated by the Farm Credit Administration, ran around 4 and 5 cents.

Table 9. Average Yearly Costs of Operating 168 Trucks Hauling Fruits and Vegetables in Western Maryland, 1933-34

Cost Items	Amount	Per Cent. of Total Cost
Interest on investment	$15.02	5.0
Depreciation	68.40	23.2
Insurance	19.97	6.8
License	8.74	3.0
Gasoline	82.67	28.0
Oil	10.32	3.5
Repairs	67.44	22.8
Miscellaneous	22.67	7.7
Total Cost	$295.23	100.0

The average yearly cost of operating the trucks is given in Table 9, together with the percentage figures. Gasoline, depreciation, and repairs were the more important items, accounting for 74 per cent. of the total expenses of $295.23 per truck. In Table 10 the average cost attributable to the transportation of fruits and vegetables is given. The fixed costs are pro-rated on a mileage basis and include approximately the same data as the first four items in Table 9. Labor accounted for practically all of the third item.

Table 10. Average Yearly Cost of Operating 168 Trucks Hauling Fruits and Vegetables in Western Maryland*

Costs	Amount	Per Cent. of Total Cost
Fixed costs	$69.96	31.9
Variable costs	93.46	42.6
Labor and board	55.82	25.5
Total costs	$219.24	100.0

*Includes labor and board of operators while en route or in market.

The variations in cost of transportation per ton-mile are covered in Tables 11, 12 and 13. Three of the most important factors in fixing this cost are the size of load, length of haul, and total mileage covered. It will be seen from the tables that farmers who hauled heavier loads, who hauled longer distances, or who did more fruit and vegetable hauling, had lower unit costs.

Table 11 shows that the cost per ton-mile dropped from 42 cents to less

Table 11. Cost of Hauling Fruits and Vegetables According to Size of Load Hauled

Average Load Hauled	Number of Trucks	Cost Per Ton-Mile in Cents	Average Length of Haul
(tons)			
0 —0.5	41	42.14	11.6
0.6—1.0	51	19.66	14.8
1.1—1.5	38	12.12	16.0
1.6—2.0	21	10.45	17.0
2.1—2.5	7	4.84	17.7
2.6 and over	10	4.85	33.1
Average	168	13.02	15.2

than 5 cents as the average load hauled increased in tonnage. Since there is no decrease shown in the last two figures we assume that the point is being reached beyond which not much more economy is likely to be obtained by heavier loads.

In Table 12 it will be seen that the cost per ton-mile tends downward as the length of the average haul increases, although the cost per trip rises continually. The departures from the trend evidenced are doubtless due to several factors. Particularly in the case of the seventh and ninth items the small size of the sample is probably responsible for the abnormality.

Table 12. Cost Per Ton-Mile and Trip Hauling Fruits and Vegetables According to Length of Haul

Average Haul	Number of Trucks	Cost Per Ton-Mile in Cents	Cost Per Trip in Dollars
(miles)			
3 thru 6	12	36.53	1.52
7— 9	21	22.53	1.62
10—12	41	15.31	1.94
13—15	38	26.38	2.64
16—18	11	11.59	2.53
19—21	14	6.82	2.55
22—24	11	11.80	2.84
25—27	5	6.70	2.68
28—30	2	17.10	5.82
31—50	7	6.46	4.46
51 and over	5	4.16	7.97
Average		13.02	2.27

Table 13 indicates how the cost per ton-mile decreases with the total mileage covered in the year by the trucks. This table may also serve to indicate the relation between the miles hauling fruits and vegetables per truck, as given in the second column, and the cost per ton-mile. The miles hauling fruits and vegetables increases fairly consistently with the total miles traveled, the factor on which the table is based. Hence, you can readily pick up from the figures the tendency toward decreasing cost per ton-mile with the increase in total truck mileage.

These data should point the way to possible economy, through less frequent trips with heavier loads, but I am not sure that these practices are feasible. Although there may be economy in hauling larger loads, if a farm is maturing only a certain quantity of crops and these must be carried to the market at the proper stage of growth, it may be necessary to make a trip every day regardless of the size of load. While the cost

Table 13. Cost Per Ton-Mile According to Total Miles Traveled and Miles Hauling Fruits and Vegetables, 167 Trucks, 1933-34

Total Miles Traveled	Number of Trucks	Miles Hauling Fruits and Vegetables Per Truck	Ton-Miles Per Truck	Cost per Ton-Mile in Cents
1,000— 2,000	14	977	316	26.91
2,001— 3,000	29	1,510	846	15.14
3,001— 4,000	25	2,030	760	19.69
4,001— 5,000	17	2,602	2,075	08.14
5,001— 6,000	26	2,605	1,137	11.09
6,001— 7,000	11	3,745	2,126	09.67
7,001— 8,000	7	3,190	2,491	06.29
8,001— 9,000	11	4,836	3,208	07.46
9,001—10,000	2	5,602	2,461	10.26
Above 10,000	25	5,442	2,529	06.90
Average		2,945	1,695	09.68

per ton-mile decreases with the length of the trip, with the average haul, and with the total miles traveled, this is no indication that the total cost of marketing per ton of produce decreases in the same way.

There seems to be an idea prevalent in some parts of Maryland that we can benefit our farmers by restricting out-of-State trucks. Many growers feel that out-of-State produce brought by truck has a depressing effect on prices. Undoubtedly this is so, for the greater the supply, ordinarily, the lower the price. It is also argued that low-grade produce is brought in to the detriment of the price of higher grade goods.

But are not these situations the result of economic forces that we are not able to control? Would restricting inbound truck movements stem the tide? If there are regions in which certain products can be raised and sent to our markets, will they not enter by some other route if not by truck, and through other channels if denied the use of our regular markets? If these regions are not able to produce continuously at lower prices than local growers, they will soon cease to compete. If they can, then Maryland farmers must reduce production costs or readjust their cropping program. If there are people in our cities who can afford only low-grade produce, then their demands will bring it to market, so long as it is produced. It will reach the market one way or another, and attempts to exclude it may merely temporarily deprive worthy people of supplies they need, without greatly benefiting anyone.

Are we justified in attempting to restrain interstate trade by shutting out produce from other States? It may possibly be done legally, through

indirect measures. But does Maryland want to take the lead in clogging the channels of interstate trade? The high standards of our country are largely the result of having few barriers to interstate trade. The richness of our national resources and the ability of our people has been reflected in abundant living because goods and people moved freely over the face of the country.

Have Maryland farmers more to gain or more to lose by restricting the entry of out-of-State produce? Are we not in the position of sending to other States much more produce than we import? The vast volume of Maryland produce which goes to Philadelphia, New York, and other cities to the north, becomes out-of-State produce the moment it crosses our boundary. When other States retaliate against the proposed restrictions, what will our net gain be? Obviously, it will not be a gain but rather a loss. Suppose the District of Columbia, which produces very little in the way of fruits and vegetables, should legislate against out-of-State produce. Wouldn't that be a great misfortune for Maryland farmers in nearby counties? What is true of fresh fruits and vegetables from Maryland also applies to the tremendous volume of commodities such as eggs and canned goods which we supply to other States.

In this talk I have tried to give you some of the early results of our study. It would be much better if you could tell me what you would like to know about truck transportation of fruits and vegetables. I could then speak directly on those problems which are bothering you. We should be glad to have an expression of these problems, and perhaps another year, when our study has progressed further, we could present our ideas as to the solutions of these problems.

SECOND SESSION

Thursday January 16, 1936

THE FEDERAL POTATO LAW

By S. B. SHAW,
Chief, Maryland State Department of Markets

The purpose of the Potato Act of 1935 is to establish such balance between production, sale, and consumption of potatoes and such marketing conditions as would give to potatoes a purchasing power equal to that which they had on the average for the years 1919-1929.

Under Title I potatoes are made a basic commodity thereby permitting the development of marketing agreements, conversion, and removal of surplus, and voluntary agreement with producers to adjust production and sales in such a manner as to improve the potato situation.

Title II provides for a national sales allotment and a tax on the first sale of potatoes sold in excess thereof. The national sales allotment for each year is to be determined by the Secretary of Agriculture after investigating the probable production and market conditions for each year.

Apportionment of the national sales allotment is based upon the potato acreage of the four years in which such acreage was highest during the 1927-1934 period. The yield for the four high years in the same period is multiplied by this average acreage, which in turn is multiplied by the average annual percentage of the total sales of the potato crop produced in the State for the years 1929-1934. After multiplying these three averages the percentage which the resulting number of bushels for any State is of the total of such numbers of bushels for all States will be the percentage of the national sales allotment apportioned to such State.

The first allotment year begins December 1, 1935 at a time when practically all potato harvesting has been completed. All potatoes harvested on or after that date will come within the requirements of the Act.

Individual sales allotments are to be based upon past production and sales of potatoes. Each individual grower has the responsibility of submitting information as to his potato production and sales to a committee of potato growers in his county. This committee is to determine the accuracy of this information and recommend an allotment for the growers in line with the allotments of other growers in the same county. A State committee composed of representative growers will review the allotments recommended by all counties in the State and assist in any adjustments that need to be made.

It is not the intent or purpose of the Act to impose any hardship upon what might be called the legitimate potato grower or the consumer. Any

individual who has grown potatoes for the past five years would be entitled to an allotment which he could sell tax exempt based upon his production and sales record for these years.

The Act does not prohibit any grower from producing all the potatoes he desires, neither does it prohibit his selling all the potatoes he wants to sell, but if any grower chooses to expand his acreage and production beyond what has been his average for the past five years, he will have to pay a tax on any potatoes sold in excess of his allotment. The determination of a fair and equitable allotment of potatoes in any State and subsequently in any county and to any individual is left in the hands of local committees of potato producers.

The Secretary of Agriculture merely determines the allotment which may be made to each State depending upon the record of that State in its past performance. It is believed that those who have been consistent growers in the past need have nothing to fear regarding the provisions of the Potato Act. These provisions will have a tendency to discourage speculation in potato production, thereby aiding in the stability of the price which the grower may receive and the price which the consumer will have to pay.

NEW VARIETIES AND STRAINS OF VEGETABLES

By ROY MAGRUDER,

U. S. Horticultural Field Station
Beltsville, Maryland

My purpose in discussing this subject is to bring to your attention some of the newer strains and varieties of vegetables in order that you may secure them for trial if you have not already done so. It should be recognized that the matter of varietal adaptation is a problem that must be solved for each man's locality, and, therefore, each vegetable grower must be on the lookout for new originations which may be of value. The number of new strains and varieties is increasing rapidly with emphasis being placed on disease and insect resistance and higher table quality in addition to the usually sought after qualities of yield and market type.

Since most of the varieties and strains I shall mention are new or relatively so, there is little definite information that we can give you concerning their behavior under Maryland conditions. Your Maryland University vegetable research workers have a variety testing program under way and I am indebted to Drs. Cordner and Frazier for some of the information on yield and market qualities of some of the varieties of tomatoes, cucumbers, muskmelons, watermelons, spinach and bush lima beans mentioned in this talk. Their observations cover trials at College

Park, and in the Oakland and Salisbury sections to which I have added observations from the work of the U. S. Horticultural Field Station at Beltsville.

Detailed descriptions will not be attempted but reference made to the differences or similarities to standard varieties or strains. Seedsmen's names used are those of the originator or introducer of the strain or variety in question and are not necessarily the only source available at this time. As a word of caution it is suggested that trials of new strains or varieties be conducted on a small scale and extended over several years before they supplant entirely the older standard strains now in use.

Beans

BUSH GREEN POD BEANS

Stringless Red Valentine is stringless as the name suggests, and is an improvement over the old type and may be of value wherever the original Red Valentine type is accepted on the market.

Asgrow Valentine and Stringless Black Valentine are both stringless selections of the old Black Valentine type. Although stringless there is considerable fiber in the side walls so that they are not rated as very high quality. Because of this characteristic they are practically useless from a canning standpoint.

Tender Green and New Stringless Green Pod are both of the round pod type, are nearly straight, stringless, and of high quality.

Wherever the Refugee type is used for canning purposes, the new Stringless Refugee, from Rogers, and U. S. No. 1 Refugee, are both tolerant to mosaic and are 10 to 14 days earlier than the old type Refugee. The Michigan, Wisconsin, and Idaho Agricultural Experiment Stations also have strains of mosaic-resistant Refugee type.

BUSH WAX POD BEANS

Asgrow White Seeded Wax, Surecrop, Davis Stringless White Wax, Golden Standard from Vaughan, and Sioux Stringless Wax, are varieties worthy of trial by any grower whose market prefers the Wax or Yellow Podded types. White Seeded Wax, Davis White Wax and Surecrop are flat to semi-flat beans, whereas Sioux Stringless has round pods which resemble Full Measure in type except that they are yellow in color.

GREEN PODDED POLE

The Virginia Agricultural Experiment Station and the U. S. Department of Agriculture have rust-resistant strains approaching the Kentucky Wonder in type. The Alabama Agricultural Experiment Station has Kentucky Wonder types resistant to nematodes.

BUSH LIMAS

U. S. No. 2 Henderson Bush is an early, uniform ripening selection from Henderson derived from plant breeding work of members of the Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, U. S. Department of Agriculture. So far as I know its earliness has not been tested under Maryland conditions. The new McCrea lima was introduced in 1933 and in tests at Beltsville last year produced plants somewhat larger than Henderson, with pods intermediate in size and thickness between Fordhook and Henderson. In season of maturity, however, it matured with Fordhook and the set was very light. Further trials will be needed to determine its usefulness under Atlantic Sea Coast conditions. Because of the small size of the pod it is doubtful if it will be an item in the truck crop production program.

Tests conducted by Maryland University workers in 1935 showed that the best yield was produced by Burpee's New Philadlephia. The pods and seeds are but slightly larger than Henderson's, and, therefore, not of value for truck crop production. New Wonder Bush resembled Burpee's Improved Bush and produced the best yield of the large podded types, ranking second to New Philadelphia in total yield. Henderson's Early Giant, a large, flat-seeded variety, was more productive than Fordhook and Burpee's Improved Bush. Dreer's Bush gave larger yields than Fordhook in the Maryland University trials, and also at Beltsville. In size of pod it is very little shorter than Fordhook and as thick. Data secured at College Park indicates that Dreer's Bush sets a greater percentage of its blossoms than other large podded varieties. It was 5 days later at College Park but at Beltsville was as early as Fordhook. It has a low, spreading habit of growth which allows some of the pods to come in contact with the soil and in wet seasons this fact may result in the rotting of a portion of the crop.

Beets, Table

Little Marvel is an introduction from Zwaan & Van der Molen and can be described as a very short foliage type with small, early maturing, Flat Egyptian roots. Because of the size of the foliage it is recommended for forcing purposes. Asgrow Wonder has been bred for freedom from white zones and has smooth, semi-flat shape with a rounded bottom and neat tap root. Asgrow Canner is of the Detroit Dark Red type and has been bred for uniformly dark red flesh, flattened globe shape, with good size foliage. Perfected Detroit, from Lupton, has medium to large size foliage and roots which are round to slightly oval in shape and with solid dark red flesh. The Ohio Canner has a medium size top and roots which are slightly flatter and freer from purple and white in the flesh than ordinary strains of Detroit Dark Red. It was bred for canning crop purposes but can be used for home or market gardening.

Good-for-All, from Ferry-Morse, has a very short top with round to oval shaped roots which have dark red skin and flesh. It does not attain a large size and is especially suited for canning whole or baby beets, as it "bulbs" up very quickly.

Improved Detroit, from the same firm, has a smaller leaf and shorter petiole with a more flattened root that has slightly more purple in the flesh than older strains of Detroit Dark Red.

Cabbage

The matter of strain is of considerably more importance in the early round-headed class than the matter of variety. Those especially interested in securing a very early maturing, round, small to medium-sized head type are referred to the results from the Ohio Agricultural Experiment Station, which conducts trials of this type at its Marietta Substation. Louisiana Copenhagen is a strain of the Copenhagen type which has been bred for solidity of head and a short core, and although especially bred for southern United States conditions, provided a very satisfactory crop at Beltsville in 1935. The heads were round to slightly oval, weighed from 2½ to 3½ pounds, and were very compact and solid. This strain is also very uniform in type.

Premier, from Henderson, is reported to be three or four days earlier than Golden Acre, with a smaller head and plant.

In the second early class, Early Seneca, from the Robson Seed Farm, Large Late Copenhagen, of Harris; and Steadfast, of Zwaan & Van der Molen, appear to be the same type from their description, and are reported to produce round heads as early as the Copenhagen Market but resist bursting in the field longer than the Glory of Enkhuizen type and produce heads as early as this variety. For late or storage type cabbage there are several fairly new strains of the Ballhead type which have good storage qualities, are productive and uniform. Oregon Ballhead, from Gill, Harris' Ballhead, Penn. State Ballhead, and Wisconsin Ballhead fall in this group. Wisconsin Ballhead is the most recent yellows-resistant strain to be introduced.

Cucumbers

For pickling purposes, National Pickling, produced at the Michigan Agricultural Experiment Station, has probably attained the greatest popularity. Double Yield, of Harris', and Grow Quick, from Vaughan, are other varieties of recent introduction. Black Diamond, from Ferry-Morse, is a pure line selection of the Stays Green type.

Tests conducted at Maryland University near Salisbury in 1935 indi-

cated that A. & C., Clark's Special, Woodruff's Hybrid, and Klondike, produced the best yields. The first three varieties are preferred because of slightly longer shape and a better color. Clark's Special was not as good in color as the A. & C., and Woodruff's Hybrid. Straight Eight, a new introduction from the Ferry-Morse Seed Company, was not as productive nor as well colored as the above mentioned varieties this past season.

Muskmelons

The Maryland University trials of 1935 indicate that Weaver Special may be of value in Maryland. This is a salmon-fleshed, Honey Dew type, which has a very sparse netting, and when properly grown is of very high quality. The fruits are round and almost smooth and of larger size than Hale's Best. Other early strains of the Honey Dew type are Early Honey Dew, from Will, which is a very early selection of the standard green-fleshed type, and Honey Ball, which is a small, round, slightly netted, green-fleshed melon.

Burrell's Superfecto produced the largest yield of marketable melons in the 1935 Maryland trials. The fruits were oval in shape with solid netting and indistinct sutures. In size they were equal to Hale's Best, but were about a week later in maturity. They have salmon flesh of high quality and a degree of rust resistance.

The New Imperial 50-15, which is highly resistant to powdery mildew (a serious disease in the West) proved to be intermediate in season to Hale's Best and Burrell's Superfecto. The yield was good, but the size was rather small. Melons were well netted with rather distinct sutures. The flesh was thick, salmon colored and of fairly good quality.

Chipman's Lake Champlain, from the Will Seed Company, is reported to be 10 to 14 days earlier than the original Lake Champlain. If true, this should make it the earliest salmon-fleshed variety. Michigan Sweet, a variety originated at the Michigan Agricultural Experiment Station, is of the Lake Champlain type, but earlier and of better quality. Early Tye, also from the Will Seed Company, is very early, but the melon is oval, of medium size, only fairly well netted, but with thick orange flesh of fair quality. Oka, originated in Quebec, Canada, is a very early pink-fleshed melon of the Hackensack shape, suited for frame culture in that Province. Honey Rock, also known as Sugar Rock, has become very popular in the Middle Western States because of its high quality. It is almost round in shape, has a slaty gray skin which is hard and enables it to carry to market well, ripens uniformly and has thick, salmon-colored, sweet flesh. Delicious resembles Bender's Surprise, but is slightly smaller and earlier. Bender's Surprise was very prolific at Beltsville last year. The melons were of large size and of very good quality. Many of the fruits weighed over 10 pounds.

Watermelons

The 1935 trials near Salisbury by the Maryland University workers indicate that several of the wilt-resistant varieties were as productive as varieties commonly grown in that section. The Pride of Muscatine, of the Kleckley Sweet type, appeared to be the best of the wilt-resistant types for Maryland market conditions. Iowa Dixie had fruit of the Stone Mountain type. Iowa Belle fruits were too small for this market. Iowa King is indistinctly striped, but is of long cylindrical shape with white seeds and somewhat later than Pride of Muscatine. The California Agricultural Experiment Station has also been breeding melons for wilt resistance. The variety most commonly used in that State is Klondike, which is an oval or slightly elongated melon.

Greystone is a light green or grey skinned Stone Mountain type. Wonder Melon is a more uniformly shaped Kleckley Sweet.

Northern Sweet, originated at the Minnesota Agricultural Experiment Station from seed obtained in Russia, matured its first melons two weeks earlier than Kleckley Sweet at Beltsville in 1935. The fruits were small, weighing from 8 to 14 pounds, almost round in shape, slightly striped with a lighter green, have a very thin rind and the reddest flesh of any variety in the trial. The flesh was also of very good quality, but inclined to become stringy when slightly overripe. This variety would seem to have promise for a small family sized melon.

Spinach

In trials conducted at College Park this fall, Virginia Savoy was the most productive of the Savoy types and was followed closely by Old Dominion. Both are mosaic-resistant strains, developed at the Virginia Truck Experiment Station. Old Dominion is reported to be slightly slower in shooting to seed in the spring than Virginia Savoy, and is somewhat more resistant to cold during the winter. It is recommended only for fall or early winter planting. Hollandia and Gaudry, from Zwaan & De Wiljes, were the heaviest producers in the Maryland fall trial. Both are dark green, smooth leaved varieties. Gaudry, or Nobel, as it is called by one seedsman, is the longest standing of the smooth leaved varieties. There are two distinct color types of both of these varieties. The original Nobel is a medium green, lighter than dark green Bloomsdale. One of the dark green strains of this type has been called Northland. Other seedsmen merely designate the difference in strains by using dark green in front of the name for the variety. With this crop again the matter of strain is very frequently more important than the variety name.

Presto is a prickly seeded dark green Bloomsdale type. Viking is intermediate in color, length of petiole, and season between Viroflay and King of Denmark. It probably will be of little value in this section. Tempo is a strain of Viroflay type that is reported to start growing earlier in

the spring when wintered over as small plants. It is not, however, yellows-resistant. It, therefore, should be used only in sections that are free from yellows. Sluis Bros., Ltd., of Enkhuizen, Holland, secured special mention in the 1935 All American Vegetable Trials for a strain of Bloomsdale Dark Green, which they have designated as Selection F. This is noteworthy because of its very dark glossy green foliage, which was considered distinct enough by the judges to merit special mention.

Tomatoes

Trials during the past two years at College Park have shown that Greater Baltimore, Marglobe and Pritchard have been superior in yield to other varieties in the trial. Most of you are no doubt acquainted with the Marglobe variety, but Pritchard may be new to some of you. It is a medium early wilt resistant variety, fruiting about a week in advance of Marglobe. It has a relatively short bearing season. The fruits are medium size, globular in shape, and when grown on fertile soil the fruit size is almost equal to that of Marglobe. It has good color and quality and is finding favor both for canning and market production. Brown's Special, an early selection of the Stone type was not superior as regards yield in the past two seasons' trials.

Rutger's, introduced by the New Jersey Agricultural Experiment Station, has been grown only in the 1935 trial and little significance can be attached to the results of one season's trial. The plants were large and vigorous and medium to late in maturity. The fruits are large and slightly flattened and the yield was not outstanding.

Four early varieties were also grown in the 1935 Maryland trials. Penn. State was the earliest of the four. Plants are very small and of the indeterminate type of growth. The foliage development is rather sparse and as a result many of the fruits were sunburned or scalded. The fruits were equal to Break o'Day in size and were fairly uniform but showed their relationship to Earliana. For best results it appears that this variety should be planted very close together on fertile soil so there will be enough foliage to protect the fruits.

Scarlet Dawn and Clark's Early, from the Associated Seed Growers, ripened at the same time and both were several days later than Penn. State. Scarlet Dawn produced globular fruits of medium size and the vines were vigorous enough to keep the fruit well shaded. Clark's Early is a strain of Bonny Best type but with slightly more foliage.

Break o'Day, one of the U. S. D. A. introductions, has been found to be very productive, with fruits of desirable size and shape. It matures 2 or 3 days later than Scarlet Dawn. Because of the open spreading nature of its foliage and the consequent sun injury to the fruits, it is not as generally valuable as the Pritchard variety which is only about three days later in maturity.

SWEET CORN TRIALS IN MARYLAND

By R. G. ROTHGEB,

Associate Agronomist

University of Maryland

The State of Maryland has long stood high in the production of sweet corn. As a result, various departments of the University of Maryland at College Park have made many studies relating to the production of this crop, especially for canning. Some years ago a program for the study and improvement of varieties was initiated. This object has been approached in two ways. First, new strains and hybrids, regardless of origin, have been compared carefully with established varieties in annual field trials. Second, actual breeding work has been initiated and is well on its way toward establishing strains and hybrids specifically adapted to Maryland.

The Development of Varieties

A clear picture of the present stage in the development of sweet corn varieties calls for a brief history of this crop in the United States. Information of such a nature is available from a recent publication* of the New York Agricultural Experiment Station, which brings together in one volume the fragmentary records of old varieties and detailed description of modern ones.

Though probably of ancient origin, sweet corn has been under cultivation by the white man a relatively short time. In fact, there is little evidence to show that the American Indian was particularly enthusiastic about the corn with wrinkled seeds that must have existed, as an impurity perhaps with many colored starchy types which the squaws cultivated. It was the latter kind of corn that first attracted the attention of the early settlers. Following the lead of their red brothers, they boiled the immature corn for roasting ears and made meal from the dry starchy kernels.

Sweet corn with its superior table quality in the milk stage seems to have attracted no attention prior to the American Revolution. Records indicate that in 1779 a lieutenant in a military expedition against the Indians carried back to Plymouth a few ears of sweet corn from the banks of the Susquehanna River. It was called Papoon Corn, and its popularity as a garden vegetable soon spread. Thus began the importance of New England as a sweet corn region.

In 1828 sweet corn was first listed in a seed catalog. At least, it was grown as early as this in Maryland, and by the end of the Civil War canneries were being established in the State.

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*Vegetables of New York, Vol. 1, Part 3. Sweet Corn, 1934.

In 1848 three named varieties and one cross with flint corn had been recorded. Not only had varieties begun to multiply, but gardeners had become conscious of a fruitful method for production of new varieties, namely, hybridization. Before the Civil War this method had been employed to bring forth Stowell's Evergreen, one of the oldest and best varieties now in existence. Nathan Stowell of Burlington, New Jersey, is reported to have developed this variety from a cross between sweet corn and a soft starchy corn. In spite of field corn parentage on one side, this remarkable variety has not only served as a standard of comparison in Maryland and elsewhere, but it has been used freely as parental stock in the breeding of new varieties and strains.

The latter half of the nineteenth century witnessed the origin of many varieties of true sweet corn, among them being such old favorites as Country Gentleman, Howling Mob, and Golden Bantam. Because of its tenderness and flavor, the latter is largely responsible for present day popularity of yellow sweet corn. The original eight-row Golden Bantam is used as a standard of comparison for kernel quality, and occurs in the pedigrees of many yellow varieties and hybrids. Unfortunately, true Golden Bantam yields very poorly in most parts of Maryland.

Since the modest beginning initiated by Papoon Corn in 1779, variety names, if not varieties, have multiplied almost beyond count. Almost a thousand names have been recorded. Many of these, however, are synomyms, (names applied to the same variety), and many others have been discarded with or without the variety which they represented. Stowell's Evergreen has been known by at least sixteen different names. Similar confusion has prevailed in case of all of the varieties. Happily, the liberal use of comparison trials by experiment stations and progressive seed companies is doing much to discourage useless duplication and the promotion of inferior varieties. In 1935 one of the larger seed companies, although meeting trade demands in many States, listed less than fifty different varieties and hybrids. So far as a given community is concerned a very brief list should take care of market demands and local adaptation.

Hybrid Sweet Corn

The last two decades have witnessed the development of a new method in the breeding of both sweet corn and field corn. This method employs the old idea of hybridization or the crossing of unlike sorts to bring about a new combination of characters in the offspring.

Today the aim is the same, but the technique is different. Instead of crossing varieties directly, the corn breeder, by means of self-pollination for several generations, first establishes inbred lines from ordinary open-pollinated varieties. The resulting inbred lines having undergone a sort of purification process as a consequence of inbreeding, show a high degree

of uniformity from plant to plant, but are usually sadly lacking in vigor. It is only with difficulty that many are perpetuated. However, when two inbred lines are crossed by transferring the pollen of one to the silks of the other, the resulting first generation of plants shows remarkable vigor as well as uniformity. Some of these "inbred hybrids" because of demonstrated superiority due to yield, uniformity, table quality, disease resistance, or other characteristics, are replacing established varieties.

Due to the fact that grain produced on hybrid plants will not breed true, it has no value for seed purposes. New seed must be purchased each year from the breeder, who is confronted with an expensive program of maintaining and crossing annually the proper inbred lines. Because of low yields of marketable seed, the great amount of handwork required and the care that must be taken to prevent foreign pollen from contaminating the inbred stocks, cost of inbred seed is necessarily high.

At present there are three types of inbred hybrids being listed in seed catalogs, namely, the single cross, the double cross, and the top cross. The single cross is the result of crossing two inbred lines. It has the advantage of great plant uniformity. However, seed cost is high, and although capable of producing an excellent crop, the appearance of the seed is often very poor. The double cross involves four inbred lines and is the result of using two single crosses as parents. It provides seed of good appearance. The top cross results from using an ordinary variety for one parent and an inbred line for the other. Although less uniform than the single cross, its popularity is growing principally because of lower seed cost.

Field Trials at College Park

These trials have been conducted in the same field for five years. An earnest attempt has been made to obtain unbiased results. Annual records as to source of seed, days to maturity, diseased plants, ear length, and yield in weight and number of marketable ears have been made public in mimeographed form. Therefore, only the high points need be discussed here.

Golden Cross Bantam

It seems to be the consensus of opinion that the most outstanding sweet corn hybrid yet produced and offered for sale is Golden Cross Bantam. Because of its excellent quality and widespread adaptability it has received much acclaim. It is a single cross yellow hybrid developed by the Purdue Agricultural Experiment Station in cooperation with the United States Department of Agriculture. Parent lines have been widely distributed and many seed companies now list it. How well Golden Cross Bantam maintains its reputation is going to depend largely on how carefully seedsmen handle their seed stocks.

It has been grown commercially on several thousand acres in Maryland, and in general, seems to be finding favor with both canners and gardeners. In the trials at College Park it has not been equalled in general performance by any sweet corn requiring as few days to reach maturity. Some of the late large types have yielded a greater tonnage, but have not surpassed it in table quality. In the former respect it has equalled commercial stocks of Stowell's Evergreen.

In these tests Golden Cross Bantam grew to the height of about five and one-half feet, suckered rather freely, and averaged over one good ear per plant. Ears were slender with 12-14 rows of closely packed pale yellow kernels. Worm injury was common, but was usually confined to the tips where it could be trimmed off. Plants and ears have shown great uniformity. Few plants have been destroyed by wilt or other diseases. In maturity it has been 3-4 days later than Golden Bantam and 8-10 days earlier than Stowell's Evergreen.

The following table compares Golden Cross Bantam with several other sweet corns.

Four-Year Comparison at College Park

	Days to Maturity	Yield		Ear Size	
		Tons	Doz.	Ins.	Ozs.
Golden Bantam	75	1.77	434	6.9	5.2
Golden Cross Bantam	79	3.13	705	8.1	6.1
Country Gentleman	86	2.82	544	7.7	8.0
Evergreen (Conn.)	88	2.97	395	8.1	10.4
Money Maker	87	3.49	622	8.5	7.6
Hopeland	87	3.67	538	8.7	10.0

Other Varieties and Hybrids

Little need be said about such well-known varieties as Stowell's Evergreen and Country Gentleman, which have long been grown successfully in Maryland.

Money Maker is an open-pollinated variety from the D. Landreth Seed Company. It is a white corn in season with Stowell's Evergreen, but has a more slender ear. In the College Park trials for four years it has made good yields in both weight and number of ears per acre. High yield together with good table quality merits for this variety consideration as a market garden corn.

Hopeland is a large white variety which has been recovered from a sweet-dent cross. It is not on the market but is being used in a breeding

program. It is listed in the table for the purpose of comparison, and illustrates what may be expected from the better adapted open-pollinated stocks from the standpoint of yield.

In the South where worm injury is severe, progress is being made in the development of worm-resistant corns, by crossing big late field corn with sweet corn. In this way several varieties with true sweet corn kernels have been obtained, which because of long, tough, tight-fitting husks, escape worm injury to a remarkable extent. Two such varieties are Honey June and Sure Cropper Sugar from the Texas Station. They were grown at College Park in 1935. Both were tall and late, coming in about a week after Stowell's Evergreen. Vigor and yields were good. Worm infestation was remarkably low. However, before these varieties definitely can be recommended for Maryland further observation is necessary.

Gardeners are usually interested in early varieties of sweet corn. Unfortunately, early sorts are poor yielders in most parts of Maryland. Because of this failing, many market gardeners rely on starchy varieties such as Early Adams for their earliest plantings. Recently, however, several yellow top crosses of true sweet corn have been put on the market. In each case Purdue 39, one of the inbred parents of Golden Cross Bantam, has been crossed on an early variety. In 1934 and 1935 top-crossed Spanish Gold and Early Yellow Sensation were outstanding for early sorts. Compared to Spanish Gold and Early Yellow Sensation the top crosses were over twice as productive. They were one or two days earlier than Golden Bantam and yielded considerably more marketable ears per acre. Although these early top crosses are small and do not have the productiveness of midseason or late sorts, they do represent improvement over older varieties of similar season.

In conclusion let it be said that real progress is being made in the attempt to find corns which fit market demands and climatic requirements in Maryland. However, the growers will not find it wise to discard old and tried sorts for new ones without careful investigation of their performance in his own locality.

REPORT OF COMMITTEES

The Nominating Committee presented the names of the following persons as officers for the year 1936:

President—Wm. E. Hotton, Salisbury.
Vice-President—E. W. Hawkins, Harmons.
Secretary-Treasurer—W. R. Ballard, College Park.

Directors:
Francis B. Todd, Sparrows Point.
Elmer Koppleman, Raspeburg.
J. Richard Fitzell, Sparrows Point.

Director Farm Bureau—Joshua Lynch, Parkville.
Delegate Farm Bureau—R. T. Merritt, Dundalk.
Director Agricultural Corporation—Wm. G. Lynch, Dundalk.

The report of the committee was unanimously adopted.

The auditing committee reported that the books of the treasurer were in order, and showed a balance as of December 31, 1935, of $41.38. The report of the committee was adopted.

The following resolution was presented by the resolutions committee:

Be It Resolved, That the Maryland Vegetable Growers' Association go on record as being opposed to any increase in commissions on the wholesale markets in Baltimore, above the five per cent. commission prevailing during 1935.

And be it further resolved that the Farm Bureau be asked to work toward the elimination of increases put into effect on January 1, 1936.

After considerable discussion the resolution was adopted, and the following committee was appointed to cooperate with the Farm Bureau:

A. M. Todd, Sparrows Point.
E. W. Hawkins, Harmons.
Joshua Lynch, Parkville.

Potato Show

The exhibit of potatoes in connection with the annual meetings was the largest yet held. Both certified and commercial classes were included, as well as a class for the junior group.

The awards made in the various classes are as follows:

GROUP I—ADULT CERTIFIED

Class I—Irish Cobbler.
First—Foster Yost, Accident.
Second—W. A. Ward, Pocomoke.

Class II—Rural (Smooth or Russet).
First—Lloyd Miller, Accident.
Second—Charles F. Kelly, Oakland.
Third—Foster Yost, Accident.
Fourth—Walter DeBerry, Oakland.

Class III—Any Other Variety.
First—D. E. Orendorf, Oakland.

Class IV—Sweet Potatoes, any Variety.
First—Carl H. Smith, Salisbury.

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Second—Edgar L. Williams, Salisbury.
Third—J. W. Toadvine, Salisbury.
Fourth—William P. Hotton, Salisbury.

GROUP II—ADULT COMMERCIAL

Class V—White Potatoes, Early, any Variety.
First—Howard Burtner, Keedysville.
Second—R. W. Burtner, Keedysville.
Third—Arthur Mitchell, Keedysville.
Fourth—Roger Burtner, Keedysville.
Fifth—Mrs. Roger Burtner, Keedysville.

Class V-A—White Potatoes, Late, any Variety.
First—Wm. P. DeBerry, Oakland.
Second—W. C. Simpson, Clarksville.
Third —Richard DeBerry, Oakland.
Fourth—Emmert Miller, Accident.
Fifth—William F. DeBerry, Oakland.

Class VI—Sweet Potatoes, any Variety.
First—J. W. Toadvine, Salisbury.
Third—Wm. P. Hotton, Salisbury.

GROUP III—JUNIOR. CERTIFIED

Class VII—Rural (Smooth or Russet) and Dakota Red.
First—Glen Kolbflesh, Accident.
Second—Paul Miller, Accident.
Third—John R. Jehle, Hyattsville.

Class VIII—Any Other Variety.
First—John R. Jehle, Hyattsville.
Second—H. L. Porter, Jr., Oakland.
Third —George Porter, Oakland.

GROUP IV—JUNIOR. COMMERCIAL

Class IX—Rural (Smooth or Russet) or Dakota Red.
First—Herbert Seabold, Accident.
Second—Richard Kolb, Accident.
Third—Raymond Schlosnagle, Accident.
Fourth—Paul Miller, Accident.

Class X—Any Other Variety.
First—Harold Duckworth, Accident.
Second—Harvey Riley, Oakland.
Third—M. M. Martin, Westminster.
Fourth—Glen Kolbflesh, Accident.
Fifth—Clark Schlosnagle, Accident.

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REPORT

OF THE

SEVENTH ANNUAL MEETING

OF THE

Maryland's Stockmen's Association

January 15, 1936

Baltimore, Maryland

The seventh annual meeting of the Maryland Stockmen's Association was held at Baltimore, Maryland, on January 15, 1936. The morning session was called to order by Mr. J. Herbert Snyder, Union Bridge, Carroll County, president of the Association. Mr. Snyder addressed the meeting as follows:

PRESIDENT'S ADDRESS

By J. HERBERT SNYDER
Carroll County

Ladies and Gentlemen: I welcome you to the opening session of the annual meeting of the Maryland Stockmen's Association. I trust that the meeting will be profitable to you as I know that it will be pleasant and profitable to me.

In considering material for my annual address the first thing that naturally comes to mind is the importance of the livestock industry in Maryland. The Agricultural Census of 1935 shows that on the 44,412 farms in Maryland there were 79,933 horses and 28,956 mules, an average of about two and a half horses and mules per farm. This is an average of about one horse or mule for each fifteen acres of harvested crops. There were 307,432 head of cattle of which 197,792 were cows and heifers over two years old. These are not divided as to dairy and beef animals, but the larger percentage are dairy animals. While our Association is not primarily interested in the dairy cow, cull animals coming out of the dairy herds have a distinct bearing on the markets for our other meats. There were 93,518 sheep and lambs, and 159,087 head of swine. Even with our small area the livestock industry is an important factor in our farm income.

The decline in horse numbers which began several decades ago has continued. While the number of horses decreased 14 per cent, the num-

ber of mules was about the same in 1935 as in 1930. In the same period dairying increased 17 per cent. This was partly responsible for the decrease of other livestock for market. Sheep decreased 52 per cent and swine 27 per cent. With better prices for these classes of livestock and a more favorable comparison with dairying, I look for an increase during the next two years.

Just where are the livestock in Maryland? Frederick County has the largest number of horses, with Washington County second and Carroll County third. Wicomico County is the leading mule user, Worcester County second, and Baltimore County third. Frederick, Harford, and Carroll Counties in that order are the leaders in the number of cattle. The leading beef producers are Frederick and Carroll with Washington in third place. Queen Anne's is the leading sheep county with Garrett second and Talbot third. It is interesting to note that a third of the sheep raised in Maryland are raised in three adjoining counties on the Eastern Shore, Queen Anne, Talbot and Kent. Frederick is the leading hog producer; Washington is second and Carroll third.

In making a resumé of the livestock industry in Maryland for the past year the most important thing has been the rapid rise in prices. In the late winter and early spring, prices almost skyrocketed. While there has been some fluctuation at times since then the scale has continued up. Horses started high, slumped a little in the fall but are now about $10.00 higher than a year ago with mules about $20.00 higher. Beef cattle are from $2.00 to $2.50 per cwt. higher than a year ago. Stockers and feeders have gone up accordingly. Sheep and lambs were slow starting up but are now up with the rest, lambs being $3.00 per cwt. higher than last January. Ten days ago hogs were off from their high tops early in the fall but were still over $2.00 per cwt. higher than a year ago. There has been a great flurry in hog prices since the Supreme Court declared the A.A.A. unconstitutional. Even now it is hard to say just what effect that will have on the hog business. The growing season has been favorable in most of Maryland. Even for those producers who must buy feed it has been favorable. Home grown grains as well as commercial feeds are cheaper than a year ago. Feeds are down from ten to twenty-five per cent, the latter applying to the price of corn on November 15. This has been a livestock year, and we producers feel grateful.

Our Association has been somewhat active during the year, but probably has missed a number of opportunities for further usefulness. Summer field meetings have been discussed for some time. At a meeting of the officers and directors of the Association a tentative schedule was worked out covering most of the phases of Maryland livestock. For various reasons only one of these materialized. This was a meeting when we were guests of the Stock Yards Company at the stockyards. The main object of this meeting was to study the summer lamb trade. The

morning was spent going over the yards and observing the different grades of lambs. The afternoon was spent at one of the packing plants observing the carcasses. An added attraction was seeing the workings of the Stock Yards Company. We were guests at a delightful lunch served by this Company. We are indeed grateful to Mr. Cash and his officers for their generous hospitality and cheerful instruction. Even those of us who were not primarily interested in lambs got a lot out of the meeting.

You will hear about the Ram Sales later on the program. Other activities to which we gave our moral, if not our active, support were the Baltimore Livestock Show, the colt clubs, and the baby beef clubs, all of which you will hear more about later.

I can not but feel that we do not make the use of our opportunities for service to the livestock industry of Maryland that we should. There are a number of projects that should be considered by the officers for the coming year. Field meetings such as the one held this year should be continued, and more added to cover the other classes of livestock. There are a number of establishments, both breeding and commercial, that would be well worth our time to visit. Some time we should all visit the new farms purchased by the University of Maryland. 4-H clubs and vocational agriculture should be our especial consideration. As an added incentive I would recommend that we furnish transportation to a certain number of these boys to some of these field meetings.

The Ram Sales have no doubt had a very beneficial influence on the type of sheep produced in Maryland. Would a purebred hog sale do the same for the hogs? Large breeding establishments in Maryland have taken up the development of beef cattle and horses, but the sheep and the hog are still the average farmer's standby. Good breeding stock of swine is at a premium in Maryland. I feel that a sale of boars and bred gilts of two or three breeds would furnish many needed replacements in the Maryland herds and would be appreciated by the buyers.

It has been a pleasure to serve as your President during this past year. It is an additional pleasure again to renew our acquaintances and friendships. To you, for the coming year, I wish that your farms produce all the feed that you shall need, that your animals grow sleek and fat, and that at the end of the year you can look back and say "A good year."

CHAIRMAN SNYDER: We will next have the report of the Secretary-Treasurer, Mr. B. E. Carmichael.

REPORT OF THE SECRETARY-TREASURER, 1935

By B. E. CARMICHAEL
College Park, Maryland

The past year has been one of encouragement for livestock production. Though not all stockmen can yet claim to be exceedingly prosperous, prices for animals and for their products are substantially higher than they had been for some time prior to 1935.

The Maryland Stockmen's Association did not show any large increase in membership for 1935 as compared with 1934, but had a slight decrease —an even hundred paid membership dues during the year, though one of these came so late in the year that it was credited to 1936. This is a far smaller membership than the Association should have. It should not be too much to expect that in 1936 there will be at least 300 paid memberships in the one organization of the State that has for its purpose the promotion of Maryland's livestock industry. Surely horses, beef cattle, sheep, and hogs are of enough importance in Maryland to justify the hope that this Association may have at least 15 members from each county of Maryland, on the average. While the membership list is smaller than it would seem reasonable for it to be, the roll carries, year after year, the names of a considerable number of stockmen who are ready and anxious to do all that they can do to promote the welfare of Maryland's livestock producers. To the support and encouragement which these men furnish year after year, the Association may be said to owe its very existence.

During 1935 the activities of the Association have consisted (1) of its Annual Meeting which was well attended and during which a number of interesting papers and discussions were presented. A printed report of that meeting has gone to Association members, and details of it will not be presented at this time.

(2) A number of Purebred Ram Sales were held in cooperation with Maryland sheepmen and the Extension Service. Details of those sales will be presented by Mr. Vial who had charge of them.

(3) One meeting of stockmen was held at the Union Stock Yards, Baltimore, for the purpose of bringing to the attention of lamb producers of the State the need for observing market requirements concerning weight, quality, and finish of market lambs. It is believed that in the future there should be held a number of meetings and tours in different parts of the State for the purpose of acquainting stockmen of Maryland with the good work that is being done by some of our more progressive breeders and feeders. There is much good to be derived from becoming better acquainted with one's fellow stockmen on their farms. The old saying "Get acquainted with your neighbor; you might like him," may well be

changed to "Get better acquainted with your fellow stockmen; you will be sure to like him, and both you and he will be sure to profit from the closer acquaintance."

(4) The Monthly News Letter has gone to members of the Association, and, in the case of the December issue, to about 400 others in the State. The News Letter is not doing all that it should do. The active assistance of a large number of Association members is needed if the News Letter is to be, in fact as well as in name, a Maryland Stockmen's News Letter.

It is believed that in the future this Association should exert a stronger influence than it has thus far exerted in affairs that concern livestock producers. A larger membership; more meetings, sectional or State-wide, or both, during the year; and greater publicity concerning the livestock work that is being done in various parts of the State should help this Association in its earnest consistent efforts to promote the progressive improvement of Maryland's livestock industry.

The report of the condition of the Association's treasury is as follows:

FINANCIAL REPORT, MARYLAND STOCKMEN'S ASSOCIATION, JANUARY 15, 1936

Receipts

Balance, January, 1935	$189.01	
Memberships, 1935, in addition to those included in 1935 Report	93.00	
Memberships, 1936	4.00	
Receipts from banquet	111.45	
Total, balance and receipts		$397.46

Expenditures

The Wm. Schluderberg-T. J. Kurdle Co., 143 plates at Dinner-Meeting, at 85 cents	$121.55	
Expenses, Misses Bresnahan and Gooden, helping at meeting	2.20	
Students' Supply Store, paper	18.01	
F. H. Sowers, printing	10.50	
Dues, Maryland Farm Bureau Federation	20.00	
M. Sullivan, 125 copies Baltimore Drovers and Traders Journal, containing report of Annual Meeting	5.00	
Pearson and Crain, 2 trophies, lettering, repairing and lacquering	22.90	
Miss R. M. Bresnahan, 521 postal cards	5.21	
R. S. Bierly, printing 200 banquet tickets	2.50	
University of Maryland telephone and telegraph account, Annual Meeting	2.62	
Total expenditures		$210.49
Balance		$186.97
Uncollected account, Ram Sale		17.00
Total assets		$203.97

It was moved and seconded that the report be accepted, and was so ordered.

CHAIRMAN SNYDER: We will next hear from Mr. W. R. Harvey, Manager of the Baltimore Livestock Show.

THE 1935 BALTIMORE LIVESTOCK SHOW

By W. R. HARVEY, JR.
Manager, Baltimore Livestock Show

The seventh annual Baltimore Livestock Show was held at the Union Stock Yards, October 8, 9, 10 and 11, 1935.

Due to the elimination of grass fattened cattle from all classes, the entries in the car lot division were very much lighter than at any of the former shows, but the quality of the cattle on exhibition was better than anything heretofore seen at any of the Eastern Shows.

There was a decided difference of opinion among the members of the trade, feeders, and exhibitors, as to the advisability of this change, but it is now pretty well conceded that it was a move in the right direction and will greatly stimulate the feeding of better cattle in the immediate Baltimore territory and at a time when they are badly needed in our market.

Collegiate Livestock Judging Contest

As has been the custom during recent years, the Collegiate Livestock Judging Contest was held on Tuesday, October 8. This contest is of educational value to the students from the several Agricultural Colleges competing in the contest, teaching them to observe carefully and to evaluate type and condition. It brings the student in contact with quality, and supplies him with experience and with an incentive which cannot help but be of value in assisting him to a more complete knowledge of livestock form in its relation to function.

Teams from four different State Agricultural Colleges were entered in the contest, namely, from The Pennsylvania State College, Virginia Polytechnic Institute, Connecticut Agricultural College, and the University of Maryland. The five members of each team, with alternates, as entered in the contest were as follows:

Connecticut State College Team:—Frank Brockett, E. Arnold Quist, Irving F. Fellows, Eleanor Brinkerhoff, Richard G. Wheeler.

Virginia Polytechnic Institute Team:—C. O. Mast, W. A. Williams, J. C. Coiner, J. H. Eller, B. A. Rucker; Alternates, W. C. Dudley, John R. Hyatt, W. C. Roberson.

Pennsylvania State College Team:—Harvey M. Russell, M. M. Smith, Ward Studebaker, Walter S. Gabler, S. F. Simmons; Alternates, W. P. Campbell, Karl P. Cotterall.

University of Maryland Team:—Harry W. Clark, Herman Ramsburg, C. M. Cissell, Thomas J. Hoshall, William Henderson.

The coaches of the respective teams were: for the Pennsylvania State College, Professor W. L. Henning; for the University of Maryland, Mr. Keith Acker; for Connecticut Agricultural College, Professor W. B. Young; and for Virginia Polytechnic Institute, Professor Paul Swaffar.

Twelve rings of animals, four animals constituting a ring, were judged by the members of the competing teams; three rings of beef steers, one of Hereford, one of Angus and one of Shorthorn steers; three rings of horses, one of Percheron fillies, one of Belgian mares, and one of Belgian stallions; three rings of sheep, one of fat lambs, one of Hampshire ewes and one of Hampshire lambs; and three of swine, one of Berkshire barrows, one of mixed barrows, and one of Chester White breeding gilts.

The Percheron fillies used in the contest were supplied through the kindness of Monocacy Farms, Frederick, Maryland; the Belgian stallions and mares by Mr. Charles Shafer, Sharpsburg, Maryland; the Hampshire ewes by Mr. S. O. Jones, Ellicott City, Maryland; and the Hampshire lambs by General Clinton L. Riggs, Foxhall Farms, Catonsville, Maryland. All these animals were a credit to the show and were of distinct service in the conduct of the judging contest.

Again, this year, the management was very fortunate in being able to obtain the services of men capable of judging animals and of grading reasons on placements.

Contest judges were: W. R. Harvey, Jr., and J. H. Zeller, judges of the swine classes; W. E. Hunt and H. S. Finney, judges of the horse classes; Allen P. Cole and J. D. McVean, judges of the sheep classes, and Sam O'Sullivan and Dr. C. D. Lowe, judges of the beef classes.

The tabulations which immediately follow present the results of the Contest:

PLACE, TEAM, SCORE AND PRIZE

First—Virginia Polytechnic Institute, 3861—$75 and Ribbon.
Second, Pennsylvania State College, 3851—$50.
Third—Connecticut Agricultural College, 3718—$25.
Fourth—University of Maryland, 3686.

HIGH RANKING TEAMS BY CLASSES

Class of Livestock, Institution and Score:
Beef Steers—Virginia Polytechnic Institute—960.
Horses—University of Maryland—1065.
Sheep—Connecticut Agricultural College—853.
Swine—Virginia Polytechnic Institute—1139.

HIGH RANKING INDIVIDUALS IN THE JUDGING OF ALL CLASSES

Rank, Institution and Score:

First—W. P. Campbell, Pennsylvania State College—883.
Second—Walcott S. Gabler, Pennsylvania State College—827.
Third—S. F. Simmons, Pennsylvania State College—801.
Fourth—C. C. Mast, Virginia Polytechnic Institute—799.
Fifth—C. M. Cissel, University of Maryland—798.

HIGH INDIVIDUALS BY CLASSES

Class of Livestock, Contestant, Institution, Score and Prize:
Beef Steers—Walter S. Gabler, Pennsylvania State College, 220—Ribbon.
Horses—W. P. Campbell, Pennsylvania State College, 238—Ribbon.
Sheep—W. P. Campbell, Pennsylvania State College, 199—Ribbon.
Swine—W. A. Williams, Virginia Polytechnic Institute, 241—Ribbon.

The Contest was won by the team representing Virginia Polytechnic Institute, and the highest ranking individual of the Contest was W. P. Campbell, an alternate from the Pennsylvania State College.

The Collegiate Livestock Judging Contest each year has drawn much favorable comment from both spectators and participants. A similar Contest will be held next year, and it is hoped that teams from several other adjacent States will then find it possible to be represented in the competition.

The judging of the car lot entries in all classes began on Tuesday morning at 9 o'clock; all individual steers and trios of steers on Wednesday beginning at 9 o'clock in the arena in front of the Stock Yards offices, with a good ringside attendance throughout the entire day. Results follow:

DEPARTMENT "A"

FAT CATTLE, OPEN TO EXHIBITS FROM OHIO, PENNSYLVANIA, AND TENNESSEE

CLASS "1"

Carload of 15 head of Steers or Heifers weighing over 1,100 pounds.

First—Frank Adair, Andersonberg, Pa.; second—Frank Adair, Andersonberg, Pa.

Champion—Frank Adair, Andersonberg, Pa.

DEPARTMENT "B"

FAT CATTLE, OPEN TO EXHIBITS FROM MARYLAND, VIRGINIA, WEST VIRGINIA, DELAWARE AND NORTH CAROLINA

CLASS "1"

Carload of 15 head of Steers or Heifers weighing over 1,100 pounds.

First—H. Teller Archibald, The Plains, Va.; second—H. Teller Archibald, The Plains, Va.

CLASS "2"

Carload of 15 head of Steers or Heifers weighing under 1,100 pounds.

First—George Holtzman, Mt. Jackson, Va.; second—Clinton L. Riggs, Catonsville, Md.; third—L. Lake, Warrenton, Va.

CHAMPIONSHIPS

Champion Carload of Cattle Department B—George Holtzman, Mt. Jackson, Va., Special prize of $50.00 for carload of Fat Cattle.

Grand Champion Carload of Fat Cattle of the Show—George B. Holtzman, Mt. Jackson, Va.

Reserve Champion carload of Fat Cattle of the Show—Clinton L. Riggs, Catonsville, Md.

DEPARTMENT "C"

THREE STEERS OR HEIFERS, OPEN TO EXHIBITS FROM OHIO, PENNSYLVANIA, TENNESSEE, WEST VIRGINIA, MARYLAND, VIRGINIA, DELAWARE AND NORTH CAROLINA

Three Steers or Heifers, fed and owned by exhibitor.

First—C. W. Litton, Tazewell, Va.; second—Foster Bros., Glyndon, Md.; third—Clinton L. Riggs, Catonsville, Md.; fourth—Cremona Farm, Mechanicsville, Md.; fifth—P. E. Bird, Marion, Va.; sixth—Highland View Farms, Sykesville, Md.

Champion Trio—C. W. Litton, Tazewell, Va.

DEPARTMENT "D"

INDIVIDUAL STEERS OR HEIFERS, OPEN TO EXHIBITS FROM OHIO, PENNSYLVANIA, TENNESSEE, WEST VIRGINIA, DELAWARE AND NORTH CAROLINA

CLASS "1"

Individual Steer or Heifer, fed and owned by exhibitor, exhibited at halter. Club steers not eligible.

First—Foster Brothers, Glyndon, Md.; second—Foster Brothers, Glyndon, Md.; third—Clinton L. Riggs, Catonsville, Md.; fourth—Cremona Farm, Mechanicsville, Md.; fifth—C. W. Litton, Tazewell, Va.; sixth—C. L. Riggs, Catonsville, Md.; seventh—Highland View Farms, Sykesville, Md.; eighth—Cremona Farm, Mechanicsville, Md.; ninth—Cremona Farm, Mechanicsville, Md.; tenth—F. H. T. Walton, Forest, Va.

Grand Champion of the Show—Charles Martin Perry, Tazewell, Va.

Reserve Champion of the Show—Foster Bros., Glyndon, Md.

DEPARTMENT "E"

4-H CLUB STEERS OR HEIFERS, OPEN TO EXHIBTS FROM OHIO, PENNSYLVANIA, VIRGINIA, WEST VIRGINIA, DELAWARE, TENNESSEE AND NORTH CAROLINA

CLASS "1"

HEREFORDS

First—Madron Sisters, Tazewell, Va.; second—Madron Sisters, Taze-

well, Va.; third—Hogueland Taylor, Petersburg, W. Va.; fourth—J. Frank Meeks, Burkes Garden, Va.; fifth—Jim Keen, Summit Point, W. Va.; sixth—H. M. Kinser, Rocky Gap, Va.; seventh—Merlin Bergdoll, Petersburg, W. Va.; eighth—Atwell Hewitt, Waynesboro, Va.; ninth—Brower Bros., Waynesboro, Va.; tenth—Earl Groves, Petersburg, W. Va.

CLASS "2"

SHORTHORNS

First—Wm. A. Davidson, Bowie, Md.; second—Bud Goodman, Marion, Va.; third—Wm. A. Davidson, Bowie, Md.; fourth—Grove Bros., Waynesboro, Va.; fifth—Grove Bros., Waynesboro, Va.; sixth—Fishpaw Sisters, Berryville, Va.; seventh—Fishpaw Sisters, Berryville, Va.; eighth—Frank McClung, Reconverte, W. Va.; ninth—Ralph Fox, Shawver Mill, Va.; tenth—Willard McKinney, Waterford, Va.

CLASS "3"

ANGUS

First—Charles Martin Perry, Tazewell, Va.; second—John Rucker, Delaplane, Va.; third—Madron Sisters, Tazewell, Va.; fourth—Alva Sites, Petersburg, W. Va.; fifth—David Childs, Berryville, Va.; sixth—Carson Thompson, Tazewell, Va.; seventh—Jack Shiflet, Waynesboro, Va.; eighth—Maurice O'Bannon, Woodville, Va.; ninth—Merlin Bergdoll, Petersburg, W. Va.; tenth—Maurice O'Bannon, Woodville, Va.

Grand Champion, Charles Martin Perry, Tazewell, Va.

DEPARTMENT "F"

FEEDER CATTLE OPEN TO ALL

CLASS "1"

Carload of 20 head of Herefords, Shorthorns, or Angus Steers or Heifers weighing under 550 pounds.

First—Harry Conley Company, Kansas City, Mo.; second—Harry Conley Company, Kansas City, Mo.; third—Harry Conley Company, Kansas City, Mo.; fourth—M. A. Mintkin, Omaha, Neb.; fifth—M. A. Mintkin, Omaha, Neb.

In the sheep division of the show, the quality was outstanding. The grand champion lamb, exhibited by Cremona Farms, of Mechanicsville, Md., managed by Sam O'Sullivan, was of the perfect packer type—short, smooth, blocky with no excess fat.

The prize-winning pen of three fat lambs, also exhibited and fitted by Sam O'Sullivan for Cremona Farms, were of outstanding quality. They were given a close run for championship honors by the entry of the Buck and Doe Run Valley Farms, of Coatesville, Pa.

The O'Sullivan lamb, a real champion, was sold to Miller Bros., Baltimore restaurant, at the record-breaking price of $1.00 per pound. This lamb, a purebred Southdown, bred by the exhibitor on Cremona Farms,

in Southern Maryland, was considered by experts as just the best lamb ever seen in the Baltimore show ring. He was short-legged deep and smooth and scaled 70 pounds. He was sired by Don Head 232, purchased by Sam from John D. Patterson, of Richmond Hill, Ontario, International winner for several years, principal stud ram at Cremona.

The champion lamb was included in the trio exhibited by Mr. O'Sullivan, who showed four lambs in all, bred exactly alike. The three, excepting the grand champion, were bought by George Ruppersberger, Jr., at 20 cents a pound.

It was the consensus of opinion that the individual and group classes in the lamb division were much better than those exhibited last year.

In the hog department of the show, all exhibits of Maryland breeders, Warner Pearce, of Monkton, Md., swept the boards. His barrow, grand champion, of the hog division, a Berkshire, was sold to Schluderberg-Kurdle for $15.75 per hundredweight. Mr. Pearce's pen of five fat hogs, also of Berkshires, were sold to the same firm at $13.50.

Sterling H. Little, of Westminster, Md., was awarded second honors for his lot of mixed breeding. They were bought by the Schluderberg-Kurdle firm at $13.00. A bunch of experimental hogs, exhibited by the University of Maryland, College Park, Md., were awarded third prize. Esskay took them at $13.00 per hundred.

The banquet held at the Lord Baltimore Hotel on Wednesday evening was attended by 400 livestock men and their friends. Mr. O. K. Quivey, chairman of the show committee, introduced Mr. Alan McGregor, who acted as toastmaster for the event.

In his usual happy manner, Hon. Howard W. Jackson, Mayor of Baltimore, welcomed those in attendance to the city and extended greetings to all present.

Hon. Harry W. Nice, Governor of Maryland, was unable to be present but was ably represented by Col. Harry C. Jones, State Employment Commissioner.

The principal address of the evening was made by Prof. Chas. V. Wilson, of Morgantown, W. Va.

Guessing Contest

As a special attraction, at each of the annual shows, visitors are given an opportunity to make a guess on both the live weight and dressed weight of an individual steer of outstanding quality.

This steer is displayed in a pen on the main alley of the yards at halter, and no charge is made to those making a guess. To the person making the closest guess of both weights, a prize of a ten pound roast from the Grand Champion Steer of the show will be given.

The actual weight of "Ethiopian," the Angus steer used in the 1935 guessing contest was: 850 pounds alive and 545 pounds dressed. Of the

975 guesses made, a student from the University of Maryland, W. E. Jarrell, Ridgely, Caroline County, Maryland, made the nearest guess of 849 pounds alive and 550 dressed, winning the 10-pound roast from the Grand Champion Steer of the show, purchased by Heinz Riverside Abattoir.

The sale of the fat cattle held on Thursday, beginning at 9 o'clock, was considered to be the most satisfactory ever held in connection with any of the shows.

The entire consignment was purchased by Baltimore packers and butchers at prices well above current prices on the yards during the week, as shown by the following analysis of the sale results.

The grand champion carload of fat cattle exhibited by George Holtzman, Mt. Jackson, Va., was purchased by Schluderberg-Kurdle Company at $15 per cwt.. The reserve champion load exhibited by Clinton L. Riggs, Catonsville, Md., going to Heinz Riverside Abattoir at $14.50. The highest selling five carloads of fat cattle sold for an average of $13.95 per cwt.

The entire offering of carload lots of fat cattle sold for an average of $13.11 per cwt.

INDIVIDUAL STEERS

In the individual and Boys' Club steer classes, the grand champion exhibited by Charles M. Perry, Tazewell, Va., was purchased by Heinz Riverside Abattoir at $40 per cwt. The reserve champion, exhibited by Foster Bros., Glyndon, Md., went to Schluderberg-Kurdle at $25 per cwt.

The five highest selling individuals sold for an average of	$17.95
The ten highest selling individuals sold for an average of	16.22
The fifteen highest selling individuals sold for an average of	15.25
The entire offering in this class averaged	14.48

BOYS' 4-H CLUB STEERS

HEREFORDS—CLASS 1

The five highest selling individuals averaged	$14.85
The ten highest selling individuals averaged	14.65
The fifteen highest selling individuals averaged	14.43
The twenty highest selling individuals averaged	14.26
The entire offering of Hereford averaged	13.85

SHORTHORNS—CLASS 2

The five highest selling individuals averaged	$15.20
The ten highest selling individuals averaged	14.20
The entire offering of Shorthorn averaged	13.67

ANGUS—CLASS 3

The five highest selling individuals sold for an average of	$21.15
The ten highest selling individuals sold for an average of	15.25
The fifteen highest selling individuals sold for an average of	14.88
The entire offering of Angus club steers averaged	15.44
The 86 head of individual and club steers, all breeds and classes averaged	$14.38

FEEDER CATTLE

The calves averaged $8.71 per cwt. with the top road at $9.50, and the heavy feeders averaged $8.50 with the top load selling at $8.35.

CHAIRMAN SNYDER: Thank you very much Mr. Harvey. The next speaker will be Mr. Jos. M. Vial of the University of Maryland, who will present a report concerning ram sales held in 1935 in Maryland.

REPORT OF 1935 RAM SALES

By Jos. M. VIAL
Extension Specialist, University of Maryland

A total of 39 rams were sold for an average price of $18.24 at three ram sales held in the State. The sales were held at Boonsboro, Centerville, and Oakland.

This happens to be the lowest number of rams sold any one year since 1927. The average price per ram was $4.39, or 31.70 per cent increase, above the averages for the sales held in 1934.

Many of the rams originally available for consignment in our sales were sold at private treaty. Some of our original consignors have ceased to devote the necessary time and attention to develop rams worthy of commanding a respectable price. This fault is undoubtedly accounted for because of the low prices obtained in recent sales.

Better prices for lambs and wool will undoubtedly react favorably for the purebred sheep grower in the long run, and we should see some improvement in the future.

I will give a summary of the results of the ram sales held in the State for the past nine years.

Year	Rams Sold	Average Price
1926	26	$41.57
1927	39	35.37
1928	40	35.67
1929	45	58.46
1930	57	31.47
1931	122	16.21..
1932	119	14.91
1933	94	19.42
1934	64	13.85
1935	39	18.24
Total number rams sold		645
Total returns		$15,487.25
Average price per ram		24.01

CHAIRMAN SNYDER: Thank you, Mr. Vial. We will now hear from Mr. Keith Acker on "A Cooperative Lamb-Feeding Experiment."

A COOPERATIVE LAMB-FEEDING EXPERIMENT

By KEITH G. ACKER
Assistant in Animal Husbandry
University of Maryland

There are annually marketed at the Baltimore Stock Yards from August 15 to November 15 many lambs which sell at relatively low prices because of lack of finish. During the season of heavy lamb receipts these lambs compete with well finished lambs and help to depress the market, and the poor quality of these lambs tends to lessen rather than to stimulate the consumption of lamb. If these thin lambs could be removed from the market, profitably fattened, and returned in a better finished condition it would help the lamb market through the months of heavy receipts and keep it better supplied with fat lambs during the winter months.

In order to obtain information on feeding thin native lambs of different grades from the Baltimore market in regard to their rate and economy of gain on different rations, the amount of gain necessary to bring them to desirable finish, their ability to use Maryland grown grains, the changes in quality and palatability of the meat due to fattening, and the amount and nature of the gain, Prof. Wells E. Hunt while at the University of Maryland conducted three feeding trials. The results of his work will soon be available in Maryland Bulletin 379.

The University of Maryland in cooperation with the Union Stock Yard Company and the United States Department of Agriculture is conducting an experiment this winter to determine the returns which might be obtained by fattening thin native lambs and to test the relative merits of a number of different rations.

Through the cooperation of the Union Stock Yards Company, Baltimore, 272 lambs, a building, equipment and feed have been provided to do additional work on this problem. The United States Department of Agriculture is cooperating in the project by grading the lambs at the beginning and at the end of the experiment; by slaughtering and running palatability tests on representative lots of lambs at various stages of the feeding period, and by examining the lambs slaughtered to determine the extent of the parasitic infestation and to recommend control measures.

The following rations are being fed.

Lot No. 1. Corn clover.
2. Corn clover (to be slaughtered at the end of 60 days' feeding).
3. Corn 9 parts, oats 3 parts, bran 2 parts, peanut-oil-meal 1 part, clover.
4. Corn, clover (not treated for parasites—all other lots are treated).

5. Corn 10 parts, peanut oil meal 1 part, clover.
6. Corn, mixed hay.
7. Corn 7 parts, peanut oil meal 1 part, and mixed hay.
8. Barley, clover.
9. Corn, clover.
10. Barley, clover.

Lots 1 to 8 inclusive are medium-weight lambs having an average weight of 58.1 pounds at the beginning of the experiment. Lots 9 and 10 are the light-weight lambs with an average weight of 46.8 pounds.

Lot 11 is a heavy lot averaging 70.2 pounds per lamb. This lot is made up of the heavy lambs which were sorted out. As this lot does not have the same amount of pen space or rack space they are not to be compared with the other lots in this experiment, but feed records are being kept of them, and weights are being taken.

The lambs are housed in a 40x100 foot barn known as the Old Test Barn located in the southeast corner of the Baltimore Union Stock Yards. This barn is divided into 10 lots 8½x30 feet with 30 feet of hay and grain rack space along one side of each lot. Water is supplied in portable tubs.

When the lambs were first purchased they were fed only hay for a few days. At the start of the experiment they were fed what hay they would clean up fairly well and very gradually started on grain, so that at the end of three weeks the light lambs were getting .8 pound of corn each. the medium weight lambs, one pound each, and the heavy lambs 1½ pounds each. The hay had to be reduced as the grain was increased. All feeds are weighed as fed, and a complete daily feed record is being kept.

It is hoped that this experiment will be of interest to Maryland farmers, and all are welcome to visit the lots at any time. If not familiar with the yards, it will be well to call at the office of Mr. J. C. Cash, President of the Union Stock Yards Company, for detailed directions as to how to find the lamb-feeding plant.

CHAIRMAN SNYDER: Dr. Mark Welsh is the next speaker on our program, and he will discuss Maryland's livestock sanitary work.

1935 LIVE STOCK SANITARY WORK IN MARYLAND

By DR. MARK WELSH
State Veterinarian
College Park

Mr. President and Gentlemen:

It is a very real pleasure for me to meet again with you and discuss disease problems as they affect Maryland livestock. It is, of course, impossible to go into details concerning many of the diseases with which we have to deal, but I can assure you that the work of the Live Stock Sanitary Service is progressing as rapidly as our facilities will permit. We have every reason to expect that the work of this department, which is in the interest of both the livestock of our State and the public health, will improve as the various phases are more closely correlated.

The long struggle to eradicate tuberculsosis from our cattle is now reaching the point where we can see the end. Approximately half of our counties are accredited or in the processes of accreditation at the present time. Two of our counties could be accredited today except for a relatively small group of owners who refuse to permit their cattle to be tested. We can, of course, legally prosecute these various individuals and compel them to permit testing, as it is in the interest of the public good. We will do this only as a final resort, and, in the meantime, we are doing everything possible to get them to agree willingly to this necessary testing work. We anticipate that by June, all counties will be eligible to be put on the accredited list. I should, however, point out that accreditation does not mean that tuberculosis has been eradicated from the county. It means that the infection rate has been reduced to one-half of one per cent. or below, and we should not assume a false sense of security from this. Annual testing of our herds must continue if we are to keep the gains that we have already made. Laxity in this is an open invitation to further trouble, and possibly serious losses. Under the Federal program, when a county is once accredited, ten per cent of the cattle are tested, each three years, and if this sample indicates the infection rate is still below one-half of one per cent, the county is reaccredited. It is possible, therefore, that in untested herds, infection may make considerable progress before being detected. I would like to emphasize as strongly as possible that we should not be lulled into the false belief that tuberculosis has been eradicated from our herds, and that work on its control can be eliminated. The major offensive against the ravages of this disease has been successfully carried out; a continuous and vigilant guard against it must be continued.

Bang's disease is another problem of great economic importance and considerable human health significance. The assistance of the Federal government in the promotion of this program has been invaluable. The work

in this State, however, has not progressed as rapidly as it has in some of the others. The majority of our producers sell fluid milk for human consumption in the Washington, Baltimore, and Philadelphia markets, and it is imperative, of course, that the needs of the market be satisfied. The quality of the milk must be beyond question, and to produce this quality, Bang's disease sooner or later must be eradicated from our herds. It is true, however, that the average returns to the owner of animals slaughtered for Bang's disease leaves him with an appreciable loss when he must purchase replacement cattle. Some few States are taking the justified view that this is a disease of both animal and human health importance, and the losses attendant upon its eradication should in part be borne by the State. I believe that the progress of this work in Maryland is being seriously impeded because of the disproportionate share of the loss the farmers must bear. I think we should give serious thought to the part the State should play in supplementing the indemnity given by the Federal government.

At present, something over 10 per cent of the cattle in the State are being tested under the Federal or State plan or by private practioner. We have a considerable number of Bang-free accredited herds at present, and there is a large number of other herds that we anticipate will be accredited within the next few months. Approximately 56 per cent more blood samples were tested in 1935 than in the preceding year. The value of having an accredited herd has been shown by returns from the sale of animals sold from such herds in comparison with sales from herds in which infection still exists. The increase in price has ranged from 25 to 50 per cent for animals of comparable quality. Our records on some 5,000 Maryland herds in which more or less testing work has been done are now kept in a complete card system, alphabetically arranged by counties. We expect to issue on February 1st, complete data on all herds under test, and to relist them each month thereafter. This work has taken considerable time, and I believe hereafter should prove of great interest and value to stockmen. At the moment, we have no knowledge concerning the future participation of the Federal government in this program. Bang's disease is, however, a disease of as much importance, to the producers and to the safeguarding of human health against undulant fever, as any we have had to combat. It is being more widely recognized as a problem of major public health importance, and has long been known as a disease of primary economic importance in the cattle industry. It would be worth eradicating for these two reasons alone. We are finding, however, that it may affect virtually every other type of domestic animal. Horses may demonstrate the infection as a poll evil, fistulous withers, and a type of muscular and joint rheumatism. Hogs are not uncommonly affected, and it is occasionally found in sheep and goats. The Live Stock Sanitary Service will be glad to cooperate with you in every way possible toward the control and eradication of this disease and strongly urges

you to participate in whatever program—State or Federal—best suits your needs.

Losses in 1935 from hog cholera were relatively low, and only 214 outbreaks of the disease were reported, which is the smallest number recorded since the work began some fifteen years ago. The number of outbreaks, in fact, have been gradually reduced over this period of years, and could be and should be reduced still further. Approximately 70 hogs per thousand died from cholera in Maryland at the time Dr. I. K. Atherton started work on this disease in 1918. Today we are losing in the neighborhood of 12 per thousand. This past year, hog cholera occurred on only about one farm in 500 where hogs are bred and raised. All of the counties reported outbreaks with the exception of Calvert. Washington County had the doubtful distinction of leading the list with 69 outbreaks, followed by Frederick and Prince George's with 17 each; Worcester, 15; Wicomico, 14; Baltimore and Kent, 8 each, and the rest of the counties had only a few each to make up the total of 214 for the State. One hundred sixty-four of the outbreaks were primary, or new centers of infection, 37 were secondary, or due to spread of the disease, and 13 were of unknown origin. One hundred thirty-one occurred under backyard conditions where hogs were kept in a pen or small lot, and 83 occurred on farms where hogs are bred and raised. As in past years, the source of the outbreaks could be largely traced to the movement of live sick hogs, that spread disease, or to the feeding of cholera-infected pork tissues. The following sources were believed to be the cause of the various outbreaks: Table scraps, 112; raw city garbage, 29; loose roving hogs, 27; purchase of new stock, 14; meat purchased for dogs, 6; virus carried on clothing, 3; serum-virus break, 3; unburied carcasses, 3; movement of male hogs for breeding, 2; infected truck, 2, and as before mentioned, 13 were of unknown origin.

It is interesting to note that over 60 per cent. of the outbreaks occurred in the four fall months of August, September, October and November, during the season when farmers are most apt to be buying meat. Our records over the past several years indicate beyond question that in Maryland, in the majority of cases, hog cholera can be prevented by nothing more costly than the use of common sense and good sanitation. Where errors have occurred, prompt use of serum in adequate doses is effective in controlling losses. Outbreaks, however, must be promptly reported if spread of this disease in the community is to be avoided. Approximately 17 per cent of our outbreaks last year were due to spread of disease, and in virtually every case the spread had occurred before the original outbreak had been reported.

Swine erysipelas is another disease that is causing some losses. Several cases have been reported in Western Maryland, and a few from other parts of the State. We have evidence that this disease is not a new infection but perhaps one that is now being more readily diagnosed than

in the past. I am confident that some ten years ago we had this infection in swine at the Maryland Experiment Station, and at that time it was considered to be a skin necrophorus. The Federal Bureau of Animal Industry is now conducting extensive studies on this infection, and several of the Middle West Experiment Stations, where the disease is prevalent, are also taking up the problem. It is a disease that may rapidly spread through the herd and cause considerable loss, or it may appear as a chronic infection in which the chief symptoms noted will be a swelling of the joints, loss of appetite, and skin irritation. Except in the early stages, treatment has proved of little value. There seems to be no particularly uniform characteristic of the disease, nor are the blood tests uniformly accurate. We need more information as to how the infection is spread, and much better control measures than we have at present. In several European countries swine erysipelas has been prevalent for many years, and causes as much or more losses than hog cholera. It is quite probable that through the intensive study now being given this problem in many laboratories in this country, more effective methods of control will be developed.

Equine encephalomyelitis (horse disease) was conspicuous by its absence in 1935. We have no record of any proved cases of this disease, although some few deaths were suspected as being due to this cause. A vaccination treatment that gave some promise of being helpful was tried experimentally on about 400 Maryland horses. Inasmuch as no infection occurred, we are unable to give any information concerning the effectiveness of the vaccination treatment. There are apparently two definite strains of virus that cause this disease—the Eastern and the Western strain. The serum effective against one is apparently of little value when used on animals affected with a different strain of virus. The Western strain of virus has now been reported as causing losses in the Middle West, and there is some reason to fear that it is gradually moving East. In the purchase of horses, care should be exercised to see that the animals are not coming from a location where the disease is currently existing.

Last year, some few abortions in mares were found to be due to a Streptococcus infection of the genital tract. In certain other cases, we had some evidence that the abortions were due to a filtrable virus. These conditions should be closely watched in breeding mares, as they are quite likely to spread, and may cause serious losses. Joint infections of foals was not infrequently reported. There is considerable evidence to indicate that better sanitary precautions should be observed where traveling stallions are used on mares. The desirability of a purebred sire law should also be seriously considered if we wish to continue to improve the quality of our horses.

Relatively little trouble has been reported among sheep. Pregnancy disease occurred in some few flocks, but is usually considered a dietary

deficiency rather than a communicable disease. Hemorrhagic septicemia occurred in a few flocks, and in one other flock considerable loss was occasioned through feeding sweet clover hay. As you may know, sweet clover hay occasionally contains a substance that prevents the blood from clotting and permits a leakage of blood from the organs and vessels into the abdominal cavity. This curious condition apparently results only through the feeding of sweet clover hay, and has not been observed among animals on sweet clover pasture. If noted in the early stages, a change of diet frequently is all that is needed to correct the condition.

Pink eye, or keratitis, caused considerable trouble in several beef and dairy herds. Occasionally the sight was lost in one or both eyes, but in most cases the infection subsided uneventfully after a few days. Placing the animals in darkened stalls together with local treatment of the eyes greatly alleviated the suffering and, of course, aided in the control of the infection.

Blackleg was again reported in some few herds. Inasmuch as this is a spore-forming organism that lives in the soil for indefinite periods of time, it is desirable that animals should be vaccinated if placed in such infected pastures. Pyelonephritis, a disease of the urinary organs, was reported in a few cases. This is an acute infection of the kidneys and bladder, due to a specific organism that apparently spreads slowly through the herd. Frequent urination, often blood-tinged, is about the only abnormality noted. A rectal examination of the kidneys, however, frequently will reveal evidence of the disease at an earlier stage. Treatment so far has not proved very effective, and it is recommended that such infected animals be removed from the herd to prevent further spread of disease.

The Live Stock Sanitary Service is now maintaining a laboratory at College Park for diagnostic and research work, and another at Baltimore for the testing of blood samples. Our space and facilities at Baltimore will not at present permit of general diagnostic work. It is my feeling, however, that, inasmuch as the Baltimore laboratory is centrally located in one of our most important livestock sections, we will be forced to broaden the scope of the work conducted there. It is, however, maintained for the service and assistance of the stockmen, and its development will depend upon your needs and demands. Nearly 200,000 different diagnoses were made in these laboratories in the past year. Nearly 100,000 blood samples were tested for pullorum disease, and nearly 70,000 for Bang's disease. The rest of the diagnostic work was on a wide variety of disease, such as rabies, anthrax, hemorrhagic septicemia, blackleg, mastitis, and the like.

Several phases of research work were completed during the year, and new problems are now under consideration. It is our desire to work on those problems that are of the most importance in Maryland. We are endeavoring to choose those that are of primary economic importance,

whose solution will either increase the profits or decrease the costs in the production of livestock. With this end in view, we have subdivided our work, so that each man has a special field in which he is primarily interested.

Dr. A. L. Brueckner is in charge of work pertaining to horses and mules; Dr. L. J. Poelma, dairy cattle; Dr. W. R. Teeter, beef cattle, and sheep; and Dr. Welsh, swine.

I should like to have you, as representative livestock men, become better acquainted with them and they with you, so that we all may better understand the problems we have to face and more rapidly and efficiently solve them. I am sure that every one of these men will be glad to cooperate with you in every way possible and to assist you in any way they can.

We have two problems of considerable importance that have been with us for many years, and it is evident will be for several years to come. One of these is the prevention of loss from poisonous plants. According to Dr. J. B. S. Norton of the Maryland Experiment Station, who is a well known authority on this subject, we have some twenty-five or thirty plants in Maryland that may cause serious illness or death in our livestock when eaten. We are attempting at the present time to have a survey made of these plants through which the range, control, and the poisonous properties may be better understood. Each year, especially in the spring and fall, deaths from poisonous plants are reported in various sections of the State. Much of this could be prevented if stockmen were familiar with the plants in question and could properly safeguard their stock against exposure. It is our hope that this information can be made available to you and to our veterinarians before long.

Parasites also continue to be a major problem. I believe that it was in 1931 that Dr. F. C. Bishopp discussed before this body a paper entitled "Some Insect Pests of Livestock in Maryland," and in 1932, Dr. Maurice Hall, Chief of the Zoological Division, discussed intestinal parasites in livestock. I think it would be well worth the time of all of us to review those two papers, as the conditions they so ably describe are still present. Dr. Hall reported that over twenty-five different kinds of intestinal parasites had been found in Maryland horses, and that comparable numbers had been found in other types of domestic stock. Colts, pigs, and other young animals are most commonly affected, and stunting, if not death itself, often results. Because the losses are not spectacular with sudden onset and death, the condition is often permitted to continue until serious damage has resulted. It is most desirable that horses be examined for parasites at this season of the year and treated if necessary. Microscopic examinations can readily be made of the feces and the kinds of parasites determined. Also considerable information can be obtained concerning

the numbers present. The drugs used in treatment, however, are highly poisonous and should be used only by veterinarians familiar with their dosage and action. In many cases through proper sanitation, the infestation of the young can be prevented. Care also should be exercised in the purchase of stock to see that they are not suffering from worm infestation. One recently purchased lot of thirty cattle in which losses were reported came to our attention. Five different types of parasites were found on post mortem, among which were lung worms, stomach worms, and tape worms. These animals were considerably stunted, were off feed, and several had a persistent diarrhea. Treatment of such badly infested stock is seldom very satisfactory, although the condition can be alleviated. It is doubtful, however, if such cattle will show a profit. It is in fact difficult to produce a profit and produce worms at the same time.

There are many other activities carried out by the Live Stock Sanitary Service, that I will not take time to discuss. I would like to mention, however, that last year, according to our records, Maryland imported 4,950 head of dairy and breeding cattle, and exported 2,866. We also imported 9,502 steers into Maryland for feeding purposes, and exported 2,159. These figures would indicate that Maryland has not reached an equilibrium whereby we can satisfy our own livestock needs. I should also like to impress on you that the grains and forages we produce on our farms have little value until interpreted in terms of meat, milk, and eggs. It is imperative, then, that the products of our land to show a profit must be consumed by healthy animals capable of efficiently transforming feeds into animal products. The veterinarians in practice and those attached to the Live Stock Sanitary Service can materially assist you in producing and maintaining healthy flocks and herds. We cannot, however, hope to do this alone. The control of animal disease, in fact, is in many respects a farm management problem. We, as veterinarians, can diagnose, prescribe, and treat, but at best our time on the farm is brief in comparison with the twenty-four hours a day the owner is with his animals. It is only through the close and friendly cooperation of those who are interested in the control of animal disease that we can hope to keep it in check and to solve the problems that are before us and combat those new conditions which are ever occurring. I can assure you of the whole-hearted cooperation of the members of the Live Stock Sanitary Service, and we have full confidence that you will assist us in every way possible in the solving of those problems that affect us all.

PRESIDENT SNYDER: This report, for which we thank you, Dr. Welch, is of much importance to Maryland stockmen.

Dr. E. B. Simonds of the United States Department of Agriculture has for years been doing Federal work in Maryland. He will present a brief statement concerning the present status of tuberculosis and Bang's disease programs in the State.

BOVINE TUBERCULOSIS AND BANG'S PROGRAMS

DR. E. B. SIMONDS
Inspector In Charge, Bureau Animal Industry
United States Department of Agriculture
Washington, D. C.

Mr. Chairman and Gentlemen: All cattle in the State are now under State and Federal supervision for the eradication of tuberculsosis, with the exception of a few herds which the owners have refused to have tested. This is holding up the accrediting of two counties, in which all cattle have been tested and the disease reduced to less than one-half of one per cent, except in these few herds where the owners have refused to test. This attitude is hard to understand when you consider the progress the work has made here in our own State, where our first test of some counties revealed an infection of thirty-six per cent, and some districts as high as fifty per cent, and we have now reduced the amount of infection until our work this year on all cattle in the State shows .6 of one per cent.

We now have eleven counties accredited or ready to accredit, and hope to have all other counties in the State accredited by July 1st, 1936.

We feel that even though this work has been so successful up to this point, the small amount of tuberculosis now found in our herds should not give a feeling of safety, and every cattle owner should continue to have his cattle tested for tuberculosis, at least once each year, for his own protection.

Bang's Disease

Many cattle owners are now taking advantage of the State and Federal plan for the eradication of Bang's disease in their herds. Under this plan, when a cattle owner signs the Federal agreement, his herd will be tested for Bang's disease, without expense to him, until it has passed two negative tests. If reactors are found, he will receive a maximum of $50.00 for pure bred cattle and $25.00 for grade cattle. In addition to this he receives all that the animals bring at slaughter.

There are now under Federal supervision 1,307 herds, with 21,353 cattle. Of these 623 herds were found to be negative at the first test and 684 herds were infected. We now have 257 herds that have passed two successive negative tests.

CHAIRMAN SNYDER: Thank you Dr. Simonds. Our next speaker will be Mr. J. C. Cash, President of the Union Stock Yard Company.

SOME OBSERVATIONS BY A STOCK YARD MAN

By J. C. CASH, President
Union Stock Yard Company
Baltimore, Md.

The two items of interest to the farmer and livestock man are production and marketing. Economical production of meat starts with the breeding or purchasing of animals of inheritance indicating the making of meat from feed consumed, and that the flesh will be on those parts of their anatomy most desired by man for food. The way you feed—the amount, kind, character and regularity determine your results. Whether you are modern or antiquated in your methods, will, in a large way, indicate the profitableness.

For advice, we usually go to one more experienced or trained than ourselves and accept their counsel and put it in practice as suggested. If you are sick you call a doctor and for a fee he tells you what to do.

Most people think marketing controls the profit in a livestock enterprise, yet they give less thought and consideration to other parts of their program. Many farmer feeders of livestock are no better informed about marketing than they are about medicine, still they persist in selling their cattle, etc., and break the market on themselves and their co-workers to avoid small fee payments at terminal markets. It's a common saying around yards that the weak sister makes the market.

A good young feeder of cattle last spring sold his cattle for ten and one-half cents at home to be weighed in Baltimore. I don't suppose he knows that the same cattle sold that same day for twelve cents. I know from experience of cattle being held in the country at one dollar and a half below their market value. I've known other men to make $2.00-$4.00 on cattle on a steady market. The packer who buys at your yard is not giving you terminal market price. He does and must deduct wages and expenses, besides a profit.

Livestock salesmen at any terminal stockyards are experts in their line. They devote their time as does a doctor or lawyer to their profession. They are in contact with market conditions, both live animal and meat, at various centers of the country. Their background of judgment for prices on livestock should be better than yours or mine. Anyone can sell on an up market as we had a year ago, and satisfy, but under average conditions I'd like to have my livestock with some one who knows more about that business than I.

There is a great wave of auction markets sweeping the country at the present time. Most auction sales put on good shows, which the owner of the livestock seems to enjoy while he disregards the object of the sale—namely the selling price of his animals. A country dealer who could

have been owner in many auction markets told me the other day some of his patrons did not use auction they never could tell what the price would be—a dozen head of uniform quality and fat might be sold in three lots varying at $1.00 per hundred in price. Then consider the possibility of disease spread, inaccurate weights, lack of financial responsibility and bond insurance, water and feed, dockage and many things which are supervised by the Government on posted markets. Then as a last thought think of the large percentage of auction market receipts bought there and finally sold on terminal, posted markets, extracting from the original owner two marketing costs and a handlers profit.

These are just a few of the items I might bring you for consideration and thought. They are not intended to be critical. It is my hope that during 1936 you can spend more time studying, enabling you to feed wisely and market soundly and profitably.

CHAIRMAN SNYDER: I am sure we all appreciate President Cash's statement based on his experience and observation. We will now hear from Mr. Mylo S. Downey, concerning 4-H Club work in Maryland in 1935. This is an activity in which every Maryland stockman should be interested.

BABY BEEF AND COLT 4-H CLUB WORK OF 1935

By MYLO S. DOWNEY
Assistant in Club Work
College Park, Md.

It will be necessary that I limit the discussion of details of this work to that which was carried out in Washington County where I was affiliated. However, in addition to the Washington County Club, six boys in Baltimore and Prince George's Counties owned calves which they exhibited and sold at the Baltimore Livestock Show last October.

In Washington County we had thirteen baby beef club members owning one Angus, one Shorthorn, and eleven Hereford calves. The Hereford calves were purchased from General Riggs of Catonsville. These calves were brought to a central point where the boys assembled and drew lots for their calves. The average weight was 375 pounds on February 16, the time the club was started. Feed and management practices were outlined by Mr. Vial. Two tours were held during the year. The calves were exhibited at the Hagerstown Fair and again at the yards of the Four States Livestock Sales Company in Hagerstown, where they were sold.

We greatly appreciated the support of Mr. W. ("Buck") Schluderberg of the Esskay Company who bought eight calves. Our local buyers hesitated at the beginning of the sale and caused the buying to lag. The champion calf sold for $16.00 per cwt., the third prize animal dropped to

$11.00 per cwt., with an average of $12.09 per cwt. for the lot. The boys report an average profit of approximately $25.00 on each calf.

We anticipate that we shall have approximately forty Maryland boys enrolled in baby beef club work this year. These boys reside in the central and western Maryland counties.

Our 4-H Colt Club Work was first organized in Washington County in 1934. In 1935 we had 43 enrolled with 35 boys completing the project. Stallion owners were helpful in locating prospective members. Boys were enrolled up to July 1st. It was not necessary that the boys own their colt, but it was required that the boy and the colt belong on the same farm.

Four educational meetings devoted to discussion of horse subjects were held throughout the summer months. The August meeting in particular was devoted to a horse judging demonstration on some practice judging at the farm of Mr. Charles Shafer where the boys placed several classes of purebred Belgians.

The Colt Show was held in connection with the Hagerstown Fair. In spite of the show being early we had thirty-five colts on exhibit. The weanling colts were first exhibited for ribbons. They were classed according to their sire, that is, all colts by a certain stallion were shown in one class. This gave the ringside spectators a chance to see the type of colts the various stallions were siring. Following these classes, all grade weanling colts were shown in one class; also, there were classes of purebred Belgian weanlings, and purebred Percheron weanlings as well as classes for purebred Belgian yearlings and for grade yearlings.

The placings in these classes counted as 30 per cent toward the cash award; the way the colt was fitted and shown, 40 per cent; participation in colt club activities prior to county show, 10 per cent; ability of member as a horse judge, 20 per cent.

A horse judging contest was held, and the boys judged a class of purebred Percheron and a class of purebred Belgian mares. You will note that in giving the awards, we made every attempt to place the emphasis on the boy rather than the colt. Unless the boys' lives are enriched by their 4-H Club experiences we can not expect our 4-H work to be of the greatest permanent value.

This project is very appealing. It is true there is a revived interest in horses generally but there is also a greater interest and appreciation of good horses by most of the boys who have been associated with the club. We hope to be able to get some colt club work going in other horse-breeding counties, and will appreciate the advice and help of your organization in developing more and better livestock 4-H Club work in Maryland.

CHAIRMAN SNYDER: No man is more fitted to treat our next subject than K. A. Clark, formerly connected with the Extension Service, University of Maryland, and now manager of Monocacy Farms, Frederick, Maryland. Mr. Clark will talk on "The Farm Horse."

THE FARM HORSE—PRODUCTION, FEED, CARE AND MANAGEMENT

By K. A. CLARK
Manager, Monocacy Farms
Frederick, Maryland

Fellow Stockmen of Maryland:

It is a pleasure to discuss the topic of horses in general because no other animal on our farms today is more popular. From the highest court in the land down we hear on all sides that the "horse and buggy days are here again." Horse numbers are far below normal. Everywhere the demand is keen for horses that can wear harness. There is more interest in breeding than we have ever seen. Farmers generally have come to recognize the horse as their preferred stock.

I may hint that the committee who drew this program assigned me a rather heavy and all-inclusive subject. My topic is one that should appear on a textbook on Horse Husbandry rather than be the title of a paper intended to consume around 15 minutes. However, I will try to outline a few thoughts I have on this subject—they will be largely drawn from my own experiences and will largely bear on how we handle our horses at Monocacy Farms. Let me say at the outset that I will welcome interruptions from any of you at any time if, in the course of these remarks, there are topics that call for more treatment than I may include.

We will start with the production of foals, which begins when the stallion and the mare are mated. We sometimes breed our wet mares on the tenth or eleventh day after foaling, especially if we are anxious to have them foal a little earlier in the season another year. Otherwise, we would just as soon and more often do breed on the 31st day after foaling. Many good horsemen seem to prefer the latter plan. There is good argument that the mares have had more time to heal and recover from foaling. They usually seem in better heat on the 31st day. We never breed mares either wet or dry as long as they are discharging abnormally or appear to be unthrifty, unclean, or unready for the horse. Both before and after serving, the penis of the horse and the exterior genital parts of the mare should be sponged with clean soap and water. I confess we sometimes omit this ceremony but it comes under the heading of desirable sanitary measures and we do it more often that we omit it. We have had quite a variety of experiences in settling our mares. Some mares seem to require but one service yet will foal regularly year after year. Others will miss a year between foals and are commonly known as the "every-other-year" kind. We believe that practically every mare should and will breed every year if the right analysis can be made of her nature. Some of them will stay in season for several days and, in rare cases, even for weeks. It sometimes helps on some of these to breed them every day for

several days so that the live sperm of the stallion will be certain to be present when the egg descends. As a general rule we much prefer to breed our mares toward the end of the heat period, for the egg is commonly believed to descend into the fallopian tubes of the mare at this period of the season. This is one reason why we breed on the 10th, 11th, and 12th days after foaling rather than the seventh or ninth, days as is often practiced. It is probably true that some mares will fail to conceive because the osuteri is small or constricted and does not relax normally during the heat period. In such cases it might be advisable to "open" mares, a practice that should be done only by a qualified veterinarian. It is doubtful whether this practice has the great practicable value its common usage might indicate. Our stallioners are instructed never to open mares for the reason that we believe this should be done only by a veterinarian. A neighbor of ours last season lost a mare opened by a stallioner, and the stallioner now has a law suit on his hands for recovery of damages. To summarize, it is my belief that mares and stallions in strong thrifty working condition and clean in every respect will when mated, show a high percentage of conceptions and produce a high percentage of live foals.

Right along this same line we find that our mares vary a great deal in temperament. Teamsters who are rough and careless while working their mares or handling them in the stables seem to have less success in getting their mares in foal. I am inclined to believe that mares will settle much more easily if they are contented and on good terms with masters. Teamsters having high-strung, nervous or temperamental mares should be particularly careful in their manners around such mares. Too many of us are too anxious to perform unusual feats of work so that we can brag about the pulling ability of our mares or the amount of work they have done. Such people should own tractors. I notice our own men who handle our mares always get along better with them during periods when they are not rushed, when they have time to give them a little extra care and consideration. We coach our men to spare them whenever possible, preferring this always to hard, strenuous knocks and punishment. Anyone who cares to do it can so plan his work that there are few or no peak periods. I know of farmers in our county who expect to do a full day's work between the hours of 9 and 5. We can all do more work and do it easier if we will get out in the morning and work more hours, but with less speed.

With such a fever to breed as now is abroad, the tendency to breed every kind of a mare, regardless, is easily explained. In our own operations we try to mate those mares to the stallions that we think will "nick" best with them. We bred mares this year for at least four different parties who own stallions of their own. It is a good sign when mare owners are willing to take their mares to the best horse available even though it may mean the payment of more service fee. On the color

question we have no particular choices or prejudices. We try to make them on the basis of conformation, quality and underpinning entirely.

Speaking of underpinning, let me say that the feet and legs of the mares we own and of the outside mares we breed are more subject to fault than any other thing about these mares. Good bottoms are an absolute requisite if any horse is to be durable and serviceable. By good bottoms I mean a foot of roomy size, not too flat and not too steep and with a fineness and denseness of texture and a toughness of hoof wall that is unmistakable. We have some mares with shallow, shelly feet. Most feet of this kind are not quite big enough or perhaps these are the kind that wear away so fast they never acquire size. Over our fields, most horses are required to be shod. About half of our own mares go the year around without shoes and I wish they might all have feet good enough to stand up to this test. When it is necessary to shoe we use flat, heavy shoes always bigger than the foot. Most blacksmiths give short measure. We have to watch them or they would soon have the feet of our big Percheron mares contracted to mule size by repeated shoeing with undersized shoes. Going above the foot I like a pastern of reasonable length and slope, cleanly and clearly defined without excessive hair. I like heavy flat cannon-bones, especially behind, setting plumb and true under large roomy, clean, sound knees and hocks. Running gears of this variety do not easily get "out of whack." They usually run true and wear as long as the horse needs them.

While we are discussing the mating and production of horses the stallion should come in for a word. That may be limited to plenty of exercise or, better still, regular work and feed enough of the right kind to keep him in condition. Of two horses of equal conformation I would always be partial to the stallion with the personality and horse sense. Such things are usually indicated by a strong, breedy, masculine, appealing head and a big, clear, intelligent eye that sees everything. When you put this kind of a front on a short-backed, deep-chested, heavy-muscled body all mounted on a proper set of limbs and make the whole weigh around 1,800 to 2,000 pounds you have just about the ideal horse from the farmers' standpoint. Within the last year many a gelding has left our community at $175.00 to $225.00 each. A few have gone out between $250.00 and $350.00 each. Most of the difference has been in the stallions that sired them.

After a mare has been bred she should be tried or teased with the horse on the 21st day and thereafter when she shows any signs of taking the horse again. Our stallion paddocks are so arranged that they are on either side of the center yard where the mares come in to water. After a mare has passed over her 21st day she will never go near the horse unless she comes in season again. I like this way of exposing the mares to the horse better than teasing them so much. I think it is possible to let a horse chew at a mare so much that you will have difficulty in telling when she is right for serving. Mares in foal will gain in weight and

flesh with moderate work and reasonable feeding. We try never to let them get too hot while working and, if the weather be cold, to keep them out of drafts, especially as they come in from work during the fall and winter months. A great many colts are lost each year by mares that have contracted colds or distemper. Mares in foal should be especially guided against these ailments. We usually wean our foals when they are 5 to 6 months of age and probably should do it sooner with mares that are raising a foal each year.

We work our mares right up to foaling time and cannot see that it hurts them. In fact, if the work is moderate and the teamster is sensible, it benefits them. When a mare is expected to foal she should be attended at night. Many a mare has been lost by this neglect; we have lost one or two ourselves. So many little things can happen at foaling time so quickly that there is just no substitute for close attention during this period. When mares do not foal quickly and normally, a veterinarian should be called promptly, for moments are precious with the colt and even his mother. We feed a laxative feed such as a little bran or alfalfa meal if it happens to be winter time. After grass comes, our mares are on pasture at night. If the foal comes normally and everything is all right he is just about as good as saved. His bowels should be watched closely for the first day or two. When they are inactive, we use warm water enemas or, as a last resort, small doses of castor oil. We have had a case or two of joint-ill and on one farm we now inoculate regularly against it. On the others we do not. Where joint-ill experience has been had, perhaps the simplest, most effective precaution is to inoculate, following the direction of your veterinarian. We have had a case or two of "colt founder," persumably induced by part of the afterbirth remaining in the mare through her failure to clean normally. Such cases are distressing and can be avoided if the attendant has his eyes open and sees to it that all the afterbirth has come from the mare. In case of doubt, the wisest procedure is to call your veterinarian and have him explore and treat if necessary. If this trouble does get by you the first symptoms will be shown in stiffness, soreness in the front feet and a rising temperature. The results are apt to be fatal unless one acts quickly, get a veterinarian at once, and get a good one. For 10 to 15 days after foaling we feed our mares sparingly. Failure to use this precaution may result in excessive milk flow and possibly digestive disorders in the foal.

We feed our foals from the time they will eat, using shelled corn or ground corn, alfalfa meal, and fish meal. Foals should be kept in the stable during the day time in summer when flies are bad, and go with their mothers to pasture at night. This includes Sundays and holidays as well as work days. When our foals are weaned, we simply carry them on the same feeds. We aim to give our foals what we think they should have rather than all they will eat. Right now we are feeding our wean-

lings ground ear corn, alfalfa meal and fish meal, with all the bright mixed hay they want. They go to the pasture every day, mostly for exercise, but still you will see them pawing and nosing through the snow for the odd bite of dead grass. Our yearlings and two-year-olds are being fed in exactly the same manner. You will observe that we use fish meal, a feed not commonly fed to horses. We find it meets our requirements for a protein supplement very nicely.

We breed our young mares at three years and break them to work during the same summer. In breaking young horses, I like to have plenty of time. This job should be done when there is no rush on, for it requires patience and time. The main things are to have a steady, dependable work horse, a strong set of harness, and a man holding the lines who is neither afraid nor easily stampeded, for they do some very unexpected things.

I believe every farmer should raise his own horses for replacement purposes and some will have to raise surplus horses to supply those who cannot or who will not do this.

CHAIRMAN SNYDER: Thank you Mr. Clark. We will hear next from Mr. James Hartnell of the Live Stock Market Reporting Service, Union Stock Yards, Baltimore.

LIVESTOCK MARKETING REPORTING SERVICE IN BALTIMORE

By JAMES HARTNELL
Union Stock Yards, Baltimore

Mr. Chairman and Gentlemen:

As local representative of the Livestock, Meats and Wool Division of the U. S. Department of Agriculture, I welcome this opportunity to talk briefly about some features of our work which may be of interest to you who are engaged in a great and essential American industry, the production and marketing of livestock. Our Baltimore office has been in operation for only a few months, hence its function and methods of operation may not be particularly well known to many of you here present, although the market reporting service has been conducted at various market centers since 1916. The Baltimore office, located at the Union Stock Yards, Baltimore, has two principal functions, namely, market news service and meat grading.

The motto of our market news service is this—"Get the news, get it straight and get it out." That, in brief, tells what we are here for, and what we are expected to do. The collection of market news information

on a nation-wide basis on livestock or on any other commodity requires first of all a group of trained reporters, who are thoroughly familiar with the commodity which they are reporting. This involves, first, a broad background of basic information regarding livestock production and marketing in all its phases. The second basic requirement of a market reporter is the ability, based on experience, education, and training, to translate the information he obtains through his daily contact with trade interests, into market news reports of interest and value to those whom we are attempting to serve.

Accuracy in reporting is no less important than gathering the information in the first place. The reporter must necessarily sift from the mass of information he obtains daily, the facts regarding the market. Rumors are ever prevalent, some false, some true, and their acceptance without investigation would be ruinous to the reporters' work, as well as to the service itself and to those who depend upon it as a guide to their activities.

Getting the news out is the third basic element of our service. Our distribution of market news information overlooks no modern means of dissemination. Radio broadcasting stations, leased and commercial telegraph wires, the press, bulletin boards and the mails all carry livestock, meats, and wool market information promptly and accurately to all parts of our country, while the news is still news and is available for prompt action.

The Baltimore office is one of 29 maintained by the Division for the collection and distribution, on a nation-wide basis, of livestock, meats, and wool market information. These offices are located at the more important marketing centers for these commodities, from coast to coast and from South St. Paul in the north to San Antonio in the south. Most of these offices, and several others which distribute but do not collect market information, are connected by a leased wire telegraph system, in operation each market day. This arrangement provides for a prompt and continuous exchange of market news reports between the principal marketing centers of the country.

Livestock market supplies vary materially from day to day at the different markets. Hence the first information required by trade and other interests is that regarding the numbers of cattle, hogs or sheep expected to arrive at the different markets during the day. This information is promptly made available to anyone who is interested. After the official opening hour of the market, the reporter, and at some markets we have several reporters covering different branches of the trade, looks over the supplies on sale, and interviews buyers as well as sellers as to market conditions, sales and prices.

One of the essentials in the establishment of a national market news service was the preparation and use of a standard system for grades of livestock, meats and wool. Time does not permit any extended discussion of our classes and grades, but they are based on best trade practices and uniformly applied, so that a good grade steer in Baltimore, for example, would carry the same grade designation on the Chicago or any other market, and the same is true of all other classes and grades. The classes are based on sex condition, as steer, heifer, cow, stag and bull, in the case of cattle. The grades of livestock are based on the three factors of conformation, finish and quality, which determine the relative excellence of the animal. In slaughter cattle, these grades range from prime to low cutter. Our reporters are required to adhere to the standards for classes and grades, so that reports from all markets are on a uniform and comparable class and grade basis.

After the reporter has obtained and verified the information received from various sources, he prepares market reports covering the day's trading up to the time the report is released. The number of reports prepared daily depends to an extent upon the size of the market, these reports being filed at most frequent intervals at the larger markets, where the volume of trading justifies frequent releases. In any event, the reports at all markets are filed for release at certain specified times, regardless of whether the trading is slow or brisk, and cover developments up to that time. The market news is dispatched promptly to other market centers by leased wires, supplied to commercial telegraph and ticker services, posted on bulletin boards, given to the press associations and to individual newspapers, to the world by radio broadcasting stations at scheduled times, and finally, sent by mail in the form of mimeographed reports to anyone who wishes to receive the information. At some markets remote control facilities have been provided at the stockyards, so that the news can be broadcast by a member of the staff as soon as it is filed by the reporter. In other instances, it is supplied to the stations by messenger, or telephone. Hence, no one who is interested need be without accurate and up-to-the-minute market news.

In addition to livestock market reporting, the Division also reports the Boston wool market, largest in the country, and the dressed meat markets in the large meat marketing and consuming centers of Boston, New York, Philadelphia, Chicago and San Francisco.

Our livestock market reporting office at the local yards is in direct leased wire contact with all the important midwestern markets. Incoming information on supplies, market conditions, and prices from these markets is ordinarily available within a few minutes after the reports are filed, and are promptly posted on the bulletin board in the Live Stock Exchange Building for the immediate use of the trade or anyone else who is interested. By direct personal contact throughout the yards, the in-

formation on the local market is gathered and distributed locally, and by leased wire to other markets. Other means of daily distribution of local market information is through the Western Union and Postal Telegraph companies; the Associated press and several of the local and Washington newspapers. On Mondays and Thursdays radio station WBAL broadcasts reports on the livestock market about 12:30 P. M. On these two days each week complete reports are prepared and mimeographed for distribution to subscribers. Since late August, when the mimeographed distribution was first started, over 30,000 of these reports have been mailed to those requesting them from the local office. The bulk went to livestock shippers in the States of Maryland, Virginia and West Virginia.

Another activity of our local office is the beef and meat grading and stamping services, which requires the full time of one grader. This service provides for the grading and identifying by means of appropriate stamps the class and grade of beef, veal, and lamb carcasses or cuts. Intended primarily for consumers, it has met with widespread popular favor in various parts of the country, and is one of the rapidly growing features of the service. Other features include certification for grades of sausage and prepared meats, and the grading for institutions purchasing meats on contract. Considerably more than 2,000,000 pounds of meat have been graded in the City of Baltimore since May, 1935. By arrangement with the Central Purchasing Bureau of the State of Maryland, the local office handles the grading of all fresh meats purchased by the State for the State Institutions, to insure compliance with specifications.

I trust that in this brief discussion of the activities of our Division I have given you at least a general picture of the field of service we strive to render. We will be glad to have you visit our office at the stockyards at any time, in order that you may observe in more detail the operation of our service, and help us to make it of greater usefulness and value to you.

CHAIRMAN SNYDER: Thank you. And now we will have a few words from our new president, Mr. Stanley Stabler.

A nominating committee consisting of the following men was named:
Mr. W. Alan McGregor, Worton, Kent County.
Mr. J. Kieffer Funk, Hagerstown, Washington County.
Mr. William J. Hines, Brinklow, Montgomery County.

This committee nominated the following men as officers in the Association, and they were duly elected:

President—Stanley P. Stabler, Spencerville.
Vice-President—K. A. Clark, Frederick.
Secretary-Treasurer—B. E. Carmichael, College Park.
Assistant Secretary-Treasurer—Jos. M. Vial, College Park.

Executive Committee:

H. N. Cohen, Easton, Talbot County.
Sam O'Sullivan, Mechanicsville, St. Mary's County.
W. R. Harvey, Jr., Corbett, Baltimore County.
Wm. H. Cunningham, Fairplay, Washington County.
S. O. Jones, Ellicott City, Howard County.

Director Farm Bureau Federation—J. Kieffer Funk, Hagerstown, Washington County.

Delegate Annual Meeting—Wm. J. Hines, Brighton, Montgomery County.

MR. STABLER: I see only one bright prospect for 1936 for the Maryland Stockmen's Association; that is, we have a very efficient vice-president. I do appreciate the honor of being made president of this Association. There is lots of work we can do this year. One thing talked about for several years and never started is trying to arrange tours to various farms. We should take a very definite part in that and I hope we will do this during the coming year. I think we should urge to get these tours started and actually hold important meetings during the summer.

Adjournment.

MARYLAND STOCKMEN'S ASSOCIATION BANQUET. JANUARY 15, 1935

Held at Childs' Restaurant
Baltimore, Maryland

Mr. J. Herbert Snyder presiding as toastmaster.

TOASTMASTER SNYDER: I know you are all having a good time, but we must be getting along with our program. I feel something like a boy in school who failed in all four of his subjects, but he said his father was prepared. Our speakers are all prepared, and I want you to prepare yourselves. The only way we can get the chance to see the Mayor of Baltimore is to bring him to dinner. We treat him a little better than the Farm Bureau did today. We invite him to dinner. They brought him up there and did not even feed him. It is with great pleasure that I call on the Hon. Howard W. Jackson, Mayor of Baltimore, for an address at this time.

HON. HOWARD W. JACKSON
Mayor of Baltimore

MAYOR JACKSON: Mr. Chairman, ladies and gentlemen, your chairman said that you treated me better than they did around at the hotel

this afternoon, made me speak and did not offer me anything, maybe they did not think it was worth anything.

Coming here tonight and seeing so many of you whom I saw this afternoon makes me think of a public speaker who always used the same speech. He was asked, "Suppose you have to speak to the same people twice?" "Oh," he said, "They never come back the second time." So you all take a great chance in coming here tonight.

I do not intend to impose myself upon you folks again after speaking to you this afternoon. I noted in the afternoon papers where Mr. Byrd spoke to you this afternoon and he said the Constitution was broad enough to meet the needs of every generation, and if not it could be changed. That reminds me of a dinner of the Advertising Club; they had a good many guests from Ohio, the guest, Mr. Jordan, President of the Jordan Automobile Company,—gave us a very enlightening, entertaining and I might say instructive talk, particularly on the subject of the automobile industry. We had as our toastmaster then Strickland Gillilan,—he gets paid for presiding and your toastmaster does not. He closed his remarks that night by saying he thought that 5 per cent of the people in the world had to do the thinking for the other 95 per cent, then Strickland, as toastmaster, agreed with everything that Mr. Jordan said about the automobile industry except about that 5 per cent; he thought he had over-estimated it. When Curley Byrd said every generation has the right to change the Constitution, he did not over-estimate it, but he under-estimates it, because this generation changed it twice, they put the 18th Amendment in and then took it out almost at the same time. There is nothing new about the right to change the Constitution if and when the people are agreed to change it.

Now, I did not come here to make a speech, I certainly have imposed upon you enough today. I am sorry I was late, but this is the third banquet I have attended since six o'clock; I move around. I am happy to run in here and meet you and welcome you to Baltimore.

TOASTMASTER SNYDER: At this time I would like to call upon Mr. H. C. Byrd, Acting President of the University of Maryland, for a few words.

GREETINGS FROM THE UNIVERSITY OF MARYLAND

ACTING PRESIDENT H. C. BYRD
College Park

Mr. Toastmaster, Mayor Jackson, distinguished guests, and members of the Maryland Stockmen's Association:

The University of Maryland has definitely committed itself to a substantial improvement of its work in the different phases of animal production. Within recent months much of importance has occurred. A livestock farm has been purchased. A farm for dairying has been secured—part of it purchased, and the balance leased with an option to purchase.

In the events leading up to these developments, stockmen and dairymen of the State have been very active in a highly constructive and cooperative way. Never in my life have I met a group of people so enthusiastic in their desire to get back of a program to help their industry. This applies to the horsemen, the cattlemen, the sheepmen, the hog men—and the dairymen as well, for not long ago a dairyman said, "We want you to start a program for livestock production, for it is one that will help us just as much as it will help the livestock industry."

With that word of appreciation concerning the fine spirit exhibited by Maryland stockmen and dairymen, I am simply going to say that we have the situation at the University now where we are able to effect an organization that should be able to achieve fine things. Land has been cleared ready for the construction of buildings, and we expect to have ready before next fall dairy and animal husbandry buildings in keeping with the importance of the industry. We hope that this progress will continue. I wish that everybody here would turn around and look at that picture for a minute—it is an architect's drawing of the plans for the group of buildings to which I have just referred. If present plans are carried out, next fall, for the first time in the history of the University of Maryland, our livestock people will have some good equipment with which to work.

We believe that the interests of Baltimore and of other Maryland cities are tied up with the interests of Maryland stockmen. If we could furnish from the farms of Maryland all of the cattle, sheep, and hogs needed by packers who operate in the State, the money for these live animals would come to the stockmen of Maryland instead of going to the stockmen of other States.

Fifteen Maryland men are going to be asked to serve as an advisory council for our animal husbandry department. This advisory council will keep in close touch with our livestock work and will greatly aid in promoting a good mutual understanding of the needs of the industry and of the work under way at the University. In this program of development, there is need for the closest cooperation of all concerned.

This afternoon a livestock man said to me, "The only difficulty with the development of the livestock industry in the State of Maryland is the fact that Maryland is not livestock conscious." That is a problem for our Extension Service, a problem which, by the way, has got to be approached with great caution and intelligence. Especially with relation to beef cattle, the program of development must be thoughtfully carried out. Unless this is done, we may get into a situation that would set back our program a great many years and possibly prevent altogether its best development.

The new facilities at the University are going to be at your disposal. We want stockmen to come individually and in groups whenever we can be of service. Dr. Patterson and Dr. Symons are whole-hearted in their desire to build up the University's livestock work in all of its phases. I want to assure you Maryland stockmen that the University is behind you 100 per cent. in your efforts to further the best interests of the livestock industry of the State. You can depend upon the University of Maryland for anything that it can offer.

TOASTMASTER SNYDER: Mr. Byrd, Maryland Stockmen welcome those encouraging words. I do not know much about the next speaker. I do know that at one time he was connected with the University of Maryland, and he left here to go to Virginia, where he is now the efficient editor of the *Southern Planter*. We are now going to hear from him on the subject "As an Agricultural Editor Sees the Stockmen's Business." I am glad to present Mr. P. D. Sanders of Richmond, Virginia, formerly of Maryland.

AS AN AGRICULTURAL EDITOR SEES THE LIVESTOCK INDUSTRY

BY PAUL D. SANDERS
Editor, The Southern Planter
Richmond, Virginia

Mr. Toastmaster, Friends of the Maryland Stockmen's Association:

As an agricultural editor, I can see the livestock industry emerging, temporarily, from a state of "dilapidosis." Stockmen have already been through the wringer and are in a favored position for the next few years. There is a decided shortage of cattle, horses, hogs and sheep, and this scarcity is reflected in favorable prices. An expansion of the industry is sure to follow—feed is available and animals are profitable. This period of expansion will prove a happy one for the farmer who understands feeding and breeding. If carried to its ultimate end, however, another era of over-production and the consequent disastrous evil of low prices will result.

And this, as I see it, is the greatest problem before the livestock producers today: that of holding production in line with effective market

demand. And when I say "controlled production", I do not necessarily mean AAA.

It did not take the Supreme Court to tell us that the Agricultural Adjustment Act was not perfect. We knew it was not the final answer to the agricultural problem, though it was the nearest approach to it thus far brought forward. I supported the AAA editorially, and will continue to support any sincere effort to bring economic justice to our farm people. It served a very definite purpose, however, and blazed further the trail already so nobly begun by the defunct Federal Farm Board. Other agricultural legislation will be enacted, carrying, in effect, the workable features of the Agricultural Adjustment Act, but devoid of its undesirable aspects. Livestock producers should, by all means, avail themselves of its provisions. They will need it badly a few years hence. I hope your association takes steps at this annual meeting to safeguard the industry against over-production.

Stockmen are rugged individuals. They like to stand alone. But I don't care how rugged you may think you are, there is not a livestock farmer in the State of Maryland who is sufficiently rugged to stave off for any great period of time the crushing blows of $3.22 hogs and $3.63 beef cattle. Yet, these prices prevailed throughout much of 1933. The packers could not make a profit even when buying at these disgraceful prices; and consumers of meat products in our cities got small comfort from cheap meat when they did not have jobs nor money with which to buy pork, beef and mutton.

We cannot blame the packers for these ruinous prices, nor criticize the housewives for crying for cheaper meat. I would place the blame squarely on the doorsteps of the Congress of the United States, and in your own backyards. The Federal government has failed miserably to extend to agriculture the same legal advantages so lavishly bestowed upon industry and labor; and you have failed, utterly, to voice your protest as a unit. In unity there is strength: Always remember the banana; as soon as one leaves the bunch, it gets skinned! Or, as the famous old negro ballad goes, "Speak up Ike and 'press yo'self!"

Although I have dwelt at length upon production control, I see it only as the first step in a sound, well-rounded livestock program. In accomplishing this end, I would urge that you produce adequately for home needs, and use agricultural outlook material to the fullest extent. This material is prepared by the U. S. Department of Agriculture and the State University for your use. Use it; it is not as complicated as it looks. Production control, therefore, is my first point.

Second, you must lower the cost of producing meat and horsepower. No matter what price packers are paying for cattle, hogs or sheep, the man who produces them cheapest makes the greatest profit. Lower pro-

duction costs will result through a better use of credit. The Farm Credit Administration is now in a position to supply the production credit needs of the livestock man. In the past, the ninety-day credit terms of our banks did not suit the needs of the livestock producer whose enterprise sometimes required three years for a turn-over. A better land use policy on stock farms will cut production costs—put more fertile acres in good grazing plants and, thereby, save the labor and expense of cultivated crops for feed. Cut protein supplement feed costs by using high protein roughage, raised on the farm.

Better individual farm management will do more to cut production costs and, thereby, increase livestock profits than any approach open to the stockmen. Use better sires, feed more scientifically—and right here the University of Maryland Experiment Station, Extension Service and the Vocational Schools of Agriculture should be your inspiration and guidance. Show me a farmer who follows his State University and supports it, and I will show you a successful farmer. In our purebred ram work in Virginia we have records of two good rams that sired 90 per cent good to choice lambs, and a scrub ram on a nearby farm whose lambs graded 10 per cent good to choice. Much has been done to control diseases and parasites of livestock; more is needed.

Or, as I recently pointed out in *The Southern Planter*: "Sheep parasite control has extended the area of profitable sheep production southward. Swine sanitation has revolutionized the method of hog raising. The entire poultry industry is built around parasite control. The eradication of the cattle fever tick opened up the Southland to the production of beef and dairy cattle. Likewise, the application of scientific methods of pest control will mark a new day in horse and mule production, and efficiency, in the South." Whether you like it or not, the wormy, "pot-bellied", "possum headed" yearling on your neighbor's farm indirectly sets the price of your steer.

The third plank in my platform for a better livestock industry is to improve methods of marketing. Although the first step toward successful marketing is the production of a marketable product, we must go a step further. We must develop a demand among consumers for quality meats, and to accomplish this, we must advertise. The food habits of people are fickle, they change easily and are quickly influenced by what they read and see.

Through the legitimate news of the daily newspapers you can do much to make city people meat conscious. An analysis of the news contents of a number of big dailies was made recently which showed that business and industry took up 21 per cent of the entire space. Sports and amusements were each 15 per cent; politics, 10 per cent (this, by the way, must have been before the advent of the New Deal); police news,

10 per cent; foreign news, 7 per cent; arts and sciences, 4 per cent; and miscellaneous, 18 per cent. Agriculture didn't even rate a heading! Every issue of the Maryland dailies should carry several stories on the cost of producing meats, the problems of the livestock producer, the food value of meat, *et cetera.*

To further solve your marketing troubles, you must develop your local home markets and practice, also, cooperative buying and selling.

And so I say in conclusion, that as an agricultural editor, I see a rainbow in the sky for the stockman. I can see him shaking off the shackles of the depression. As he emerges, I would say to him: First, in some way hold your production in line with effective market demand; second, lower production costs by proper use of credit, a better system of land utilization, and by better individual farm management; third and last, improve your methods of markets, through advertising and by cooperative buying and selling.

TOASTMASTER SNYDER: Thank you, Mr. Sanders. Your many friends in Maryland are always glad to see you and to hear you.

MAYOR JACKSON: May I say "Good Night"?

I have listened to "Curley" Byrd as to what is being done, and Pete who speaks so well, but frankly as I sit by the sidelines and on the sidelines here is the impression that I get, and I leave this with you for what it is worth.

We can all get up and tell what we think ought to be done, but what I observe when I read a program,—a 7-point, or 8-point or 9-point, as a result of a conference of the Manufacturers' Association or some group of industrial or commercial men,—what I think we need in this nation is a conference of all interests, industrial, commercial, social, agricultural, labor and everything else,and on that basis have the law of this land. You cannot pass a law unless you know what the people want. The 18th Amendment was passed, a very basic law in the opinion of some of the people,—but we want something in the interest of all of the people, we have 120,000,000 all dependent on each other. I do not want to be misunderstood. That is what I observed as I sat in the firing line. We have got to have co-ordination. We should have certain basic, fundamental laws as far as this country is concerned, and if we can do that without wiping out, all right, but do it on the basis of personal liberty,—State rights, or any other kind of rights, what we have got to do is to be right with each other.

TOASTMASTER SNYDER: We are sorry you must leave so soon, Mayor Jackson, and we thank you for coming and for what you have said. Our next speaker is Mr. E. Z. Russell of the United States Department of Agriculture, well known to many Maryland stockmen, and himself a livestock producer in Maryland. He will discuss "Constructive Livestock Production."

CONSTRUCTIVE LIVE STOCK PRODUCTION

BY E. Z. RUSSELL
Bureau of Animal Industry
U. S. Department of Agriculture

The producer of market livestock has but little if anything to say about the price he receives for the animals he markets. If he ships them to the open market he takes what the packer buyer and the commission man agree upon. If he sells them to some buyer at home he may "dicker" with the buyer, but the price is almost entirely controlled by the price at the market center.

He does, however, have a lot to say about what it costs to produce the animals he sells. This cost depends a lot on the production program he has or does not have, but which I am sure he should have if costs are to be held within bounds. First of all this production program should be a diversified one. The producer should heed the old, old story, of not putting all his eggs in one basket. I feel quite sure that there should be hogs, cattle and generally sheep on practically any Maryland farm. In addition why should not at least a part of his work horses be mares so that he may produce his own power? He surely can do it more cheaply than to be continuously in the market for a horse or a team. Then let us not forget the hen—that invaluable member of the farm livestock family, often neglected and probably more often belittled by the male part of the farm family, but an essential cog in the farm machine, nevertheless. So then we have hogs, cattle (milk or beef or both), sheep, horses and poultry.

This production of livestock should be so adjusted as to the numbers of the different classes kept, that the grain, hay, and pasture crops will as nearly be sufficient to grow and fatten them as is practical. In other words, raise enough livestock to consume the grain and hay crops and don't be a buyer of feed except as may occasionally be necessary and may offer unusual opportunity for profitable returns.

The program, once formed and put into effect, should be of a permanent nature with but minor timely adjustments and not temporary, fluctuating year by year. In other words, the producer should be a producer and not a speculator. Altogether too many producers are what we call "in and outers," thereby making their business one of speculation. Of course, there is always a certain amount of speculation in the livestock production business but let's try to keep it down to a minimum.

The production of livestock is only one of the various farm activities, but one of great importance. It is a business in which one should not think of engaging for a short time, three, four or five years. It should be a lifetime work and made a lifetime study. The producer of livestock

must be a student of livestock. He must be able to detect the strong and the weak points of an animal and in making a study of animals he must train his mind to be continually giving the most attention to the most essential point and not be carried away with some minor point. For instance, don't consider the spread of toes on a boar or a sow as of as much importance as a deep side, a well-rounded ham or a good spring of rib. Don't let a little off color be of greater importance than a uniform body, a good, well-shaped head, with wide-open clear eyes. The breeder of any kind of livestock is often seriously handicapped in the selection of his breeding animals if he must conform to some particular markings, for instance, six white points, a white belt, a red bull or cow, or a certain per cent of the body a certain color.

From a breeding standpoint it will take at least five years to show constructive results in the production of hogs and twice that long in the case of cattle or horses. This looks like a long time, but these years will be busy ones and full enough of snags, promises, and disappointments to make time pass swiftly.

Because of the length of time necessary to get well started in the production of good livestock, the necessity of being extremely careful in the selection of foundation animals at once becomes apparent. A good judicious selection of the foundation animals may easily put one five or more years further along than if inferior ones were selected.

Price should, of course, be a factor, yet one should not let a few dollars stand in the way of getting the right kind of a cow, a bull, a sow or a boar when he is starting a herd. The same is true in the selection of necessary additions to the herd as time goes on.

The profit to be derived from the business depends on many factors, one of the most important of which is the selection of additional animals, usually sires, to be put into the herd. Sometimes we think that progress is mighty slow, but just the same we are progressing, and our bulls and boars and rams and stallions are better than they were ten, twenty or thirty years ago.

I have stated that we must be students of animals, of their good and their bad points, and of their conformation in general. How then can we best be students of these various points? Naturally, by observation, by seeing good animals and comparing them with others, but we are apt to fail miserably if we just stay at home and see only our own stock. It is the dollars we have left after our expenses are all paid that count, so we must be careful of expenses. Let me right here try to draw a difference between an expense and an investment. I maintain, that although it costs some money and also some time to go annually to some good livestock show, the money and time spent in this way are an investment and not an expense. I know of no other way to keep up

with the procession, and let me say right here that if you will fit out and show an animal or two you will be a much more interested student, you will be a much better judge of what it takes to make an animal of the top class, than you will be if you are a disinterested spectator. But be you an exhibitor or a looker-on, go to the show or fair and make a study of what is there. In doing this you must keep clearly in mind the animals you have at home, that correct comparisons may be made and also you must have a mind of your own and not always blindly follow the opinion of the judge placing the animals.

What I have heretofore said has been devoted to the animals themselves, their quality and conformation and to their selection. All of this is a very important part of the business, but there are other things of about equal importance. Regardless of how carefully we study conformation and how carefully we make our selections, we are doomed to failure if we neglect feeding and housing. I often think that a master feeder is born not made. The good feeder is continually looking over the stock he is feeding. He knows how each individual is doing and perhaps an individual will be selected out for some special care or feed for a few days. Animals are creatures of habit the same as human beings and they know when feeding time comes just as well as you do. It is your business to be as prompt in the time of feeding as you should be in meeting your obligations at the bank. I knew a very successful livestock feeder in our locality whose good wife said he would step into his overalls and be out feeding when the time came, if the President of the United States were visiting him. As I have said the hogs or cattle will be there and ready, and why should you not be? You will be if you are a first-class feeder.

Not only must the feeder be on the job, but he must use the right kind of feeds. Rations must be balanced, and they must be liberal. The profitable market animal must be kept growing from the time it is born until it goes to market. Pasture is of the greatest importance. It must be nutritious and abundant. All of us have seen so-called pastures that were nothing but an area of land with a fence around it. Nothing in the way of grass was within the enclosure. A good abundant pasture is the cheapest source of gain.

Another important factor is housing in winter and shade in summer. If the very best of our animals are housed by a wire fence in a snow storm they cannot gain, likewise if they are out in a pasture on the hot summer days without any protection from the rays of a blistering sun, they are not doing as they should. They should be protected from inclement weather with good, dry, comfortable, but not necessarily expensive quarters. Have them comfortable all the time.

The Purebred Business

Not a very large per cent of livestock producers are in the business of raising stock to sell for breeding purposes. The purebred business is

a perfectly legitimate one and should be one of profit, but a considerable proportion of the breeders of purebred livestock do not make it profitable. May we just take a little time to consider reasons why it is not profitable. There are many of them. First let me say that among the breeders of purebred livestock we have altogether too many who are simply mating animals to produce young. They are not students of individual animals, not students of what it takes to make a good individual, not students of pedigrees; and, besides, they are careless feeders and caretakers.

The successful breeder of purebred livestock must be an actual constructive breeder; that is, the one who stays in the business and makes that business successful. He will have customers who will depend on him to furnish them with breeding stock year after year, and if he is to supply their requirements he must keep abreast of the times.

The successful breeder must be a first-class salesman. There are two general methods of selling purebred livestock, private or public sale. There are advantages and disadvantages in both. If by private sale, the sale season is extended over a much longer time, for by public sale, it is practically all over in one day. If selling is done by public sale, one must gamble to some extent on the weather; however, not so much in these days of good roads and automobiles as in the old days.

One of the causes of failure in the purebred livestock business is that of extending credit to a purchaser. You be the producer and let the other fellow be the banker. In other words, sell for cash only. The prices you receive may not look so good, but they will do you more good financially.

In closing I want to impress on you that the successful livestock producer does not succeed by sitting around the house and telling the other fellow how to handle and care for his stock. He must be on the job and also be willing to work. He will be awarded in keeping with his efforts. May I illustrate this by a story I heard some years ago at Chicago told to a meeting of the 4-H Club boys and girls. It happens to be about a preacher, too. This preacher for some good reason had accumulated quite a good amount of money. He went over to preach at a poorer church, and he took his little boy ten years old with him. As they went in the church there was a contribution box there, and the preacher put a dollar bill in it. After the sermon as he was coming out of the church, the other minister opened the contribution box and he said, "When we have other ministers here, we always give them the money that is in this box." Our minister refused to take it, told him to give it to some poor family. "No," he said, "that is our rule, and you must take it." So he opened the box, and all the money in it was the dollar bill that the first preacher had put in. His little boy looked up and he said,

"Daddy, if you had put more money into it you would have gotten more out."

TOASTMASTER SNYDER: Mr. Russell, we appreciate your thought-inspiring discussion of a topic that is important wherever livestock is kept. The Baltimore packing industry is represented here tonight by Mr. Wm. F. Schluderberg, and we shall be glad to hear briefly from him.

FROM A PACKER'S POINT OF VIEW

W. F. SCHLUDERBERG
President, The Wm. Schluderberg-T. J. Kurdle Co.
Baltimore, Maryland

Mr. Toastmaster, honored guests, ladies and gentlemen:

It was good to hear what you plan to do in 1936. I would like to comment favorably on what President Byrd had to say regarding the development of the livestock facilities at the University. I am very much encouraged by what he intends to do for the livestock departments at the University.

While sitting here, I have been reminiscing a little and thinking seriously about this Maryland livestock industry. I am a Marylander vitally interested in Maryland, and as a meat packer intensely interested in livestock production as well as in other phases of the livestock and meat industry of the State. I was thinking in terms of what can be done to speed up the progress being made in the development of the livestock industry—to stimulate livestock production in this State.

During a recent trip into Iowa, I observed carefully the relationship that exists between the packing industry and the livestock production part of the meat industry. The close cooperation and mutual encouragement there makes me regret from a packer's viewpoint that the packing industry here has not been more actively interested in livestock production in the past. I would like to be a little more specific. I visited Fort Dodge, Iowa, where a friend of mine has recently built a new meat packing plant to determine the advantages of killing there instead of at his eastern plants. The low freight rate on dressed meats in relation to livestock rates gave him severe competition from interior Iowa packers and has made all of us in the east more conscious of the disadvantage of the freight rate structure. The effect of the low rate on dressed meat from the interior Iowa section is to give unfair competition to Maryland producers and eastern packers.

I was very much interested in this experiment of a substantial and large eastern meat packer taking his slaughtering operations out to Iowa, and you can appreciate, I am sure, what this reduction in eastern slaughter means to eastern livestock producers. We are one of a group of

Maryland packers. We are interested in Baltimore and in Maryland, and if the situation existing today is such that there are some obstacles in the way of Maryland producers and packers we should work together to remove those obstacles. We have this livestock rate case before the Interstate Commerce Commission awaiting a decision. By this action we are making an effort to maintain the best interests of our own State. I do believe we have got to think a little more about this thing of cooperation. I think the packing industry—and I am sorry that more packers are not here at this dinner—should be more interested in your problems, and you should be more interested in our problems.

I would like to pay a tribute to Mr. Harvey for his management of the Livestock Show. You will recall that the Livestock Show was a direct by-product of the survey of the State's resources made by the State Development Commission. This survey brought out the opportunities for livestock production in the State of Maryland, and one of the things that resulted in an effort to encourage such production was the Livestock Show. We are also indebted to Mayor Jackson for his liberal financial support of the show. We should take definite steps to bring about more general cooperation and support for the Livestock Show. Another thing worthy of remembering is that while the last Livestock Show was in progress it had very little publicity. We should have more publicity and do something to bring about more interest from the standpoint of the consumer in this Livestock Show, which affords a general idea of the livestock industry in the State of Maryland.

On several occasions, I have said, and I will repeat, that those in the livestock industry, in the stockyard industry, the packers, the retailers—all must cooperate. I don't know whether you folks have heard this criticism, "You can't buy good beef in Baltimore." That remark "burns me up." I think the Livestock Show has stimulated raising and feeding of better livestock by Maryland producers. I know the packers have assisted in encouraging that, but we should also take upon ourselves another responsibility, that of educating the retailer and the consumer concerning the value of the better grades of meat. I think this is the real job that has to be done. This is not meant as a criticism and we can all agree that a great deal of education is needed in that direction. Now that there is more appreciation by the producers of livestock of the value of better types of animals, I think packers can go ahead with some assurance of improved supplies of good quality locally produced livestock, and encourage the dealers to distribute more of the better grades of meat. I believe there is a demand for better finished, better quality cattle, not as wide as you would like to have, but a better demand which will develop further if stimulated properly. You know, even if the packer is interested to the extent of going to the stock yards and buying this better livestock, if he cannot sell this meat to the consumer he cannot continue to buy such livestock. If we are going to encourage

the packing industry and livestock production in Maryland, we must have the cooperation of the general public. Only such cooperation can make this whole program successful.

It would be worthwhile to have a conference of representatives of the whole livestock and meat industry in the State to consider the problems of the different phases of the industry. Such cooperative effort would be for the best interest of the livestock and meat industry of the State. I could ramble along quite a bit on the subjects mentioned, but these remarks will suffice to bring out the packers' viewpoint.

TOASTMASTER SNYDER: To Mr. Schluderberg, other speakers, guests, and members of the Maryland Stockmen's Association, I wish to express my appreciation of your assistance in making our Annual Dinner-Meeting a genuine success again this year. This concludes our program tonight and the final session of our Annual Meeting. The meeting stands adjourned.

REPORT
OF THE
ANNUAL MEETING
OF THE
Maryland Tobacco Growers' Association

January 16, 1936
Baltimore, Maryland

The annual meeting of the Maryland Tobacco Growers' Association, held in cooperation with the Maryland Farm Bureau Federation, was called on Thursday, January 16, at 9.20 A. M., at the Lord Baltimore Hotel.

Hon. Thomas Parran delivered the president's annual address.

Mr. P. G. Minneman of the Agricultural Adjustment Administration, U. S. Department of Agriculture, delivered the following address:

LOOKING AT THE FUTURE THROUGH THE PAST

By P. G. MINNEMAN
Agricultural Adjustment Administration

The subject for our discussion at this time was to have been the new adjustment program for Maryland tobacco. As you all know, the decision of the Supreme Court has stopped the work on the new Maryland Tobacco Adjustment program, which was to follow the present program expiring with the 1935 crop. It will perhaps be most interesting for us to look backward briefly to what has taken place in tobacco production in the past. History has a habit of repeating itself. There is an old adage which says that we should profit from our experiences and learn from the lessons of the past. Let us, therefore, for a few moments look at the future through the eyes of the past.

There is no question but that tobacco is distinctly an American product. Columbus discovered its use on the Island of Cuba in 1492. The Colony of Virginia was probably the first to introduce the cultivation of tobacco. John Rolfe, famed husband of Pocahontas, is said to be the first civilized tobacco grower in 1612, well over 300 years ago. The stimulus for commercial tobacco production, however, came from Europe, the center of the white civilization. The demand in Europe increased rapidly; 20,000

pounds were exported to England in 1619; 500,000 in 1626 and about 1,500,000 pounds by 1670. History records that it required 80 ships to export the crop in 1670. Just prior to the Revolutionary War exports reached 100,000,000 pounds. During the Revolutionary War exports dropped to 15,000,000 pounds, and did not again reach 100,000,000 until over 100 years later.

While the tobacco production was increasing rapidly, prices were dropping rapidly. In 1620 a price of 54 cents a pound is recorded. This dropped to 6 cents a pound twenty years later, and to 4 cents at the outbreak of the Revolutionary War.

The reason for this decline in price in Colonial days was similar to the reason for low prices today. The Colonies were increasing their production more rapidly than Europe could use the tobacco. Wars, in this country and in Europe, as well as legislation against the use of tobacco reduced the demand and helped to cause the over-production.

Records indicate that the growers struggled continually to maintain prices, and to adjust their production. The first law passed by the first General Assembly in this country in 1619 was to fix the price of tobacco at 3 shillings per pound for the best grade. Laws were also passed requiring the inspection of all tobacco before it was sold. Other laws provided for the collection of rents and taxes in the form of tobacco. The price of the various grades of tobacco was fixed by law, tobacco was made legal tender, tobacco notes were issued as common currency, store accounts were kept in terms of pounds of tobacco rather than in dollars and cents; debts were measured in pounds of tobacco, and laws provided that all debts could legally be cancelled upon the payment of 40 per cent. in tobacco at a fixed price. We read that in 1623 a law provided for a fine of one pound of tobacco for each absence from church on Sunday morning.

It is interesting to note that fixing the price of tobacco, alone, did not accomplish the desired purpose. Production continued to increase and export prices continued to fall. Therefore, in 1628, a law was passed regulating production. No person could plant or tend above 2,000 plants of tobacco for each member of his family. Even this did not prove adequate. Later the amount was reduced to 1,500 plants per "poll"; and the law required that certain trades people and professional people could not grow any tobacco at all. Even this measure was not sufficiently effective, because the number of people who could grow tobacco was large and increased rapidly. It is interesting to note that in 1632 another approach was made. A law provided that every farmer had to plant at least two acres of corn for each member of his family under penalty of losing his right to plant tobacco. This provision is comparable to the provision in our present tobacco contracts requiring the production of less tobacco and more extensive crops to conserve the soil fertility.

A few years later in 1639, the situation became more critical and a Virginia law was enacted requiring that one-half of the good tobacco of that year and all of the poor tobacco must be destroyed. In certain other years no tobacco at all was permitted to be planted.

Another interesting fact is that while one Colony provided for the necessary adjustments in production, the neighboring Colonies increased their production, with a result that the desired adjustment and prices were not obtained. In order to overcome this difficulty in 1666, the three Colonies—Maryland, Virginia and Carolina—all signed a treaty to stop all plantings for one year. But a historian reports that even this measure did not prove satisfactory because each Colony mistrusted the other and hoped to obtain the advantage of higher prices resulting from the adjustment made in the other Colonies. Twenty years later, in 1683, some growers again wanted to cut out all production for one year, but were unable to obtain the passage of the necessary law. These persons then became "Night Riders" and destroyed the plant beds of many farmers. The next year a law was passed providing a death penalty for "Night Riders".

It is hard to realize that about 300 years ago tobacco growers within a hundred miles of here were confronted with the same problems that confront the tobacco growers today, and that a variety of measures were enacted for farm relief. Prices were fixed, debts were cancelled, tobacco was graded, low grades were destroyed, production per farmer was limited, some years were cut out entirely, and treaties between Colonies provided for adjusting production.

The entire history of the agriculture of this country has been one of adjustments. The problem of the tobacco growers in Colonial days was only the first of a large number of important agricultural adjustments. Later, with the westward expansion into the Ohio and Mississippi valleys, all agricultural production in the Atlantic States had to be adjusted to the increased western production. Some important adjustments resulted from changes in transportation. As canals were built, new areas were opened up and further adjustment was necessary. Later with the advent of railroads, the great western plains were opened up and more far-reaching adjustments were necessary.

The general policy of this country with respect to agriculture has been one of encouraging and assisting the individual farmers to make the necessary adjustments. The establishment of agricultural experiment stations and the Extension Service acted to find out and to advise farmers generally what adjustments would pay best on their own individual farms and how such adjustments might best be made. Government action did not particularly assist growers to bring about collective action in making adjustments, but left the farmer free to make his own adjustments.

But the advent of automobiles, trucks, and tractors tremendously increased the capacity for production and reduced the demand for feeds; and the World War and its far-reaching after-effects precipitated American agriculture's greatest acute adjustment problem.

The agriculture of the country was so deeply disrupted that farmers demanded stronger measures to help them in making the necessary adjustments. The Agricultural Act of 1929 "to promote orderly marketing and production", provided for the Farm Board, which advised growers as to what the adjustments should be made, and regulated the marketing of farm products through the purchase of surpluses.

However, these measures proved to be inadequate. Farm income continued to decline, and in 1933 the Agricultural Adjustment Act was passed to provide for the adjustment of production to consumption in order to obtain parity prices for farm products.

When the Agricultural Adjustment Act was passed in 1933, the total income of the 400,000 farm families growing tobacco in the United States was $107,000,000, or only about one-third as much as the income from tobacco ten years earlier, in 1923. In other words, the income from tobacco per farm family dropped from $720 to $250. This amount had to cover the labor of all members of the family, returns on the farm investment and equipment, fertilizer, machinery, canvas, taxes, marketing and all other expenses.

To state it in another way, in 1923 out of every dollar paid by the consumers of tobacco products, the grower received slightly over 12 cents, while the manufacturer received 5½ cents in the form of profits. But ten years later the consumer's dollar was divided differently. The growers received only 4½ cents, while the tobacco manufacture's profits amounted to 10 cents.

Tobacco adjustment programs have been in effect during the past three years. The farm income of tobacco growers has been increased from the low of $107,000,000 in 1932 to about $249,000,000 estimated income from the 1935 crop. This is almost two and one-half times as great as in 1932.

The total returns to growers of Maryland tobacco declined from nearly $7,000,000 in 1929 to a low point of $3,800,000 for 1933. The reason for the low returns of 1933 are evident from the fact that the total supply of Maryland tobacco had reached a record high; in other words, the accumulation of production in excess of consumption resulting in an extremely large carry-over from preceding years' crops, and a supply far in excess of the demand. This resulted in a correspondingly low total return to growers.

The principal reason for the accumulation of excessive stocks was the rapid and continual decline in export demand. Prior to 1928, the exports of Maryland tobacco were considerably greater than the quantity used

in this country. About 60 per cent. of the crop was exported prior to 1928. In 1929, exports made up only 40 per cent. of the total disappearance. In 1934, exports declined to 30 per cent. of the total, and indications are that in 1935, exports will amount to only about 20 per cent. of the total.

The exports of Maryland tobacco for the calendar year 1935 will be approximately 5,000,000 pounds, as compared with over 7,000,000 pounds in 1934, about 9,000,000 in 1933, and 10,000,000 in 1932. The political policies, trade restrictions, and monetary policies of foreign countries have probably been the chief factors in reducing the quantity of Maryland tobacco exported from the United States. Since the World War, foreign countries have made a strenuous effort to become self-sufficient, and to import as little as possible. This policy has resulted in encouraging tobacco production in such countries and in their colonial possessions. In other cases it has resulted in establishing import quotas and preferential tariff rates which have discouraged the importation of Maryland tobacco. The higher prices prevailing for Maryland tobacco following the World War have also encouraged European countries to search for substitutes for Maryland tobacco. It is doubtful whether any large part of the export trade for Maryland tobacco may be regained in the near future.

The domestic consumption of Maryland tobacco on the other hand presents a much brighter picture. As you know, Maryland tobacco is used in this country entirely in the manufacture of cigarettes, and the consumption of cigarettes is increasing. For the first ten months of 1935, the consumption of cigarettes has increased about 7 per cent. above a similar period in the preceding year, and indications are that the cigarette production may continue to increase. From 1929 to 1930, approximately 10,000,000 pounds of Maryland tobacco were used in the manufacture of cigarettes. Available figures indicate that in 1934 this amount was increased to about 17,000,000 pounds, and that for 1935 it may approximate 21,000,000 pounds. However, it is possible that the withdrawals reported as Maryland tobacco may include some tobacco not strictly of that type; and it is probable that part of the large increase in the quantity of Maryland tobacco used domestically during the past two years may be due to the lower rate of processing tax on Maryland tobacco, as compared with Burley and flue-cured tobacco. In view of these considerations, it seems reasonable to believe that domestic consumption of Maryland tobacco, during the next few years may not be as large as that during 1935; and may not exceed 18,000,000 pounds.

Let us for a moment examine the outlook and consider the problem confronting Maryland tobacco growers. The greatest loss in demand has been in exports. What may be done to regain part of the lost export trade? It is highly questionable whether any action that may be taken

by Maryland growers would materially affect the quantity exported, since the cause of the reduced exports does not lie in the field of free play of supply and demand, but is due primarily to Governmental restrictions of importing countries. A reduction in price might result in some increase in exports, but since the restrictions are largely imposed by the Governments of importing countries, it seems only reasonable that the greatest hope for increasing exports would lie in the field of agreements between Governments, that is, trade agreements between this country and the importing countries.

Obviously, since the domestic market now makes up nearly four-fifths of the total, Maryland tobacco growers should give particular attention to meeting the demands for types, and qualities suitable for domestic cigarette manufacture, and that careful attention should be directed toward producing the quality and the quantity needed for that purpose. It appears that the present excess supply is largely that of the lower grades; therefore, the plan proposed by Maryland growers to keep off the market the lowest grades of each grower's crop, seems best adapted to an immediate remedy of the excessive supplies.

The most profitable adjustment does not always mean a reduction in the crop. For instance, the 1934 crop of flue-cured tobacco of slightly over 550,000,000 pounds, sold at an average price of 27.4 cents and returned growers $151,800,000; whereas the considerably larger 1935 crop, 200,000,000 pounds larger than the 1934 crop, is averaging 20.6 cents per pound, but will probably return growers over $6,000,000 more than the higher-priced 1934 crop. The lower price of the 1935 crop is much more favorable to maintaining our export position. Insofar as price continues to be a factor in determining the quantity of tobacco exported, and the quantity used in this country, growers must give careful consideration to adjusting their production to such a figure as will not unduly reduce the exports or the domestic consumption.

As you all know, the recent decision of the Supreme Court has stopped all work in connection with production adjustment contracts. Payments under the present 1934-1935 contracts have been stopped, and it will require action by Congress before payment under these old contracts may be completed. A bill to provide for the completion of such payments has already been introduced before Congress. Of course, all consideration of the new production adjustment contracts for 1936 has been stopped, and any future action will depend entirely upon new legislation which may be enacted by Congress.

Any measures adopted to aid agriculture in the future should have as their broad objective a balance between production and consumption to obtain a real income and a standard of living for farmers comparable with that of other groups. Such measures should provide for soil conservation and the preservation of our national resources, and should be

so applied as to promote and encourage efficient production and good farming practices.

In conclusion, let me again call your attention to the fact that the entire history of agriculture has been one of adjustment. In Colonial days, growers were confronted with problems in many respects similar to those which confront Maryland tobacco growers today. Legislation was enacted to regulate prices, to regulate production, to grade the crop, and even to insure a well-balanced system of farming through requiring the production of other crops than tobacco. After all, adjustment is nothing new. The question is not, shall there be adjustment, but rather, shall the adjustment be made by the 400,000 tobacco growers working individually, or is it possible to aid the individual growers and help them to cooperate in making adjustments collectively through Government action in order that the adjustments may be for the benefit of the largest possible number of people rather than for a smaller group.

Dr. F. B. Bomberger, president of the Baltimore Bank for Co-operatives, gave a very interesting address on "Co-operation".

REPORT

OF THE

Home and Community Committee Meeting

Lord Baltimore Hotel

January 16, 1936

Baltimore, Maryland

On Thursday morning, January 16th, 1936, the thirteenth annual meeting of the Home and Community Committee of the Maryland Farm Bureau Federation was called to order, in the ballroom of the Lord Baltimore Hotel, by the chairman, Mrs. Harry T. Williams of Kent County.

Meeting opened with the singing of "America", led by Mrs. R. G. Spoerlein of Carroll County, with Mrs. Todd at the piano.

Prayer was led by Mrs. Joshua A. Fowble of Baltimore County.

Minutes of the previous meeting read by Mrs. R. C. F. Weagly of Washington County were approved.

"The Church in the Wildwood" and other songs were sung by the group.

Mrs. Harry T. Williams, who was one of the few chosen from the large delegation to the national convention to make an audition while in Chicago, gave a brief report of the honors won for Maryland.

Two of the Maryland farm women speaking contest winners—Mrs. R. G. Spoerlein, Carroll County, and Mrs. W. W. Rambo, Queen Anne's County—made fine contributions to the enjoyment of all present by giving their addresses. Following is Mrs. Spoerlein's address, with which she won first place in the State contest and second place in the national contest:

"THE FARM HOME AND THE WORLD TODAY"

By MRS. RANDALL SPOERLEIN
New Windsor, Carroll County, Maryland

When the pilgrim fathers first set foot on American soil, they were happy in their new-found freedom. They were awed by the responsibilities that freedom brought to them,—the responsibility of establishing homes in face of the dangers constantly lurking around them—the respon-

sibility of building communities in the wilderness and of laying the cornerstone of the nation which *now is.*

The first American home was a rural home, independent and self-sustaining. The world lay around it unknown, and held no claim upon it. Yet, so solid was the foundation of that pioneer home that there has been reared a nation, proud, independent and unafraid. A nation the world should honor and respect.

In our complex civilization today, the farm home can no longer be self-centered. Nor can we who live in it escape our obligation to society, to religion, to industry, and to our Government and the world at large. Every rural home is in constant touch with all parts of the world through the radio and the Associated Press, two tremendous factors in the regime of our national affairs. We are no longer confined to the solving of our home and community problems, but we are face to face with national and world problems.

There are two characteristics of the rural home which have always been outstanding contributions to American life—character and courage. There is no better place for building character than by constantly working with mother earth and learning her secrets of better plant life and by the study of animal life and its highest development. Throughout our history, the creators of the American home have been fearless, yet in the past five years, especially, the very watchword of our farm homes has been courage,—courage to face discouragements, disappointments, and disaster which has threatened our agriculture. We have been bold, persistent and confident in the face of pending disaster.

Much of the credit for these three requisites belongs to the farm woman, for she has widened her sphere of interest from the home to State and national affairs. She has studied industry and its effect upon the finances of her home and community. She has become interested in cooperative buying and selling and has come to realize the advantage of selling the farm products direct to the consumer. She has come face to face with civic affairs and is taking an active part in politics by the side of her husband. Yet, with all these new responsibilities, she is a co-worker with her family in the serious business of the agricultural industry. As the pioneer mother was the restrained power in the American life of yesterday, the mother of today is the unrestrained, dynamic power of today's American life.

Someone has said that the industry of farming is the one business in which father, mother, children, hired help, animals and the soil cooperate with God in giving the world its daily bread. That is why it builds character and courage. The farmer must be persistent in face of discouragement, and he must have an undying faith in God, who is his senior partner, that all will be well.

Another important factor to be considered is the relation of the farm home to the church. Up until a quarter of a century ago our country knew only competitive denominationalism and then began to dawn a new era, an era of cooperation and practical christian fellowship. The rural community contributed an important part in bringing about this new movement. The young people of the rural home saw with increasing clarity the advantage of cooperation in their farm and community organizations and asked the question, "Why can we not cooperate in church activities as well?" It was the same cooperative idea of industry carried into our rural religious life. Today we are one with our city neighbor in a united, organized movement to uphold the principles laid down by the Christ that our world might know them better and be made better by them.

In the past decade, the farm home has done much toward higher education in our rural communities, but there is much more to be done. Statistics show us a picture of a great rural State defaulting on more than two-thirds of its legislatively stipulated payments to local school districts, while at the same time spending millions for building improvements. Are marble halls of greater importance than our rural children? Are we so blind to conditions that we are falling down, instead of ascending the ladder of solving our educational problems? Is not the world touching our future America when it touches the welfare of the children in our farm homes?

Another important factor is the effect of the producers' prices on the world trade. It was but a few years ago the farmer took the prices set upon his produce as a thing not to be questioned. The farm home was deprived of the luxuries of the city home. Today they are becoming equal in convenience and luxury. Why? Because the producer has at last awakened from his long sleep and is beginning to demand value due him. For example, the cooperation of the cotton farmers and its most gratifying results; the cooperative distribution of milk, poultry, eggs, and practically every farm product that is handled with the producer in mind, as well as the consumer. This is not only true of America, but practically the whole world. Farmers' real income must take into account not only prices at which they sell, but the amounts sold and the cash income from other sources. Then, this total cash income must be measured against the farmers' costs. In April, 1935, the farmers' cash income totaled $507,000,000 compared with $387,000,000 in April, 1934. The department of commerce reports that the consumers paid their bills more promptly in the past year than in previous years. There is a point of balance which must be found by both the farmer and consumer. Will our world trade be effected by this point of balance?

Samuel Rezneck in a recent article quotes, "The countryman with his dirty acres is richer than the tradesman on paper pinions—and if country people could but unite against disorganizers as they greatly outnumber them, they could put them down at once". The world of agriculture is

awakening to the reality of this statement and is fighting for the security of our farm industry and our farm homes.

The world is challenging us—the tillers of the soil—to make safe the industry that we love and the industry that feeds the millions—to build that industry upon the foundation of right thinking, square dealing, and cooperative effort. The challenge comes to the farm home for young men and women who are God-fearing, clean in soul and body, who are bold, persistent and courageous.

The security of the world today rests upon the farm home and it is your responsibility and mine to meet this tremendous obligation.

Miss Venia M. Kellar, State home demonstration leader, very graciously carried her audience on a most delightful tour, "My Vacation in Europe", but, because of the lack of time, was unable to make the return, therefore, her listeners keenly anticipate hearing the remainder of her travel talk.

The chairman, whose presence was requested in the directors' meeting at 11.30 o'clock, asked the vice-chairman, Mrs. Harry Davis of Frederick County, to preside over the meeting for the remaining period.

Mrs. Williams retired after making a few remarks, which she concluded by saying that there must be some one else elected chairman.

Mrs. Verna Hatch of the Pennsylvania Farm Bureau was then introduced. Mrs. Hatch gave a very forcible and convincing address, "Cooperation—The Way."

The County Home and Community chairmen assembled in another room for the election of officers, after which vice-chairman, Mrs. Davis, reported that Mrs. Roy C. F. Weagly was elected chairman; Mrs. Harry T. Williams, vice-chairman, and Mrs. Randall G. Spoerlein, secretary.

Mrs. Davis also reported a resolution: That an officer, after serving three consecutive years, cannot succeed herself. And the voting body of county chairmen suggested: That a meeting of the county chairmen be held once a year, some time during the annual meeting.

Mrs. Weagly accepted the chairmanship with brief remarks, after which Mrs. Davis requested her to take the chair.

Mrs. Weagly then introduced Mrs. E. C. Dunning, chairman of the Women's Committee of the Inter-State Milk Producers' Association. Mrs. Dunning conveyed greetings from the women of the Inter-State.

ANNUAL WINTER MEETING

OF THE

Maryland State Poultry Council

January 14, 15, 16, 1936

Lord Baltimore Hotel

Baltimore, Maryland

REPORT OF COMMITTEE ON BREED IMPROVEMENT

By WADE H. RICE
Chairman

The Committee on Breed Improvement, like some of the other standing committees of the council, is perhaps on the basis of status quo, since it has not yet begun to function as a committee. A meeting of the committee was called for August 13th in conjunction with the council's summer meeting at College Park, but the other members were unable to attend.

However, during 1935, several developments in breed improvement work have taken place which are of considerable interest to the poultry industry in Maryland.

These developments concern the National Poultry Improvement Plan in its relation to Maryland and other nearby States.

The National Poultry Improvement Plan was originally drafted by the coordinating committee of the Commercial and Breeder Hatchery Code at Cleveland during the International Baby Chick Association meeting in August, 1934. Following the drafting of the plan a number of conferences and hearings were held, and various organizations of the poultry industry offered suggestions and amendments. Revisions were also made by Federal departments, and officials in Washington who were concerned. A national hearing was called by the Federal Government in Chicago in August, 1935,

during the International Baby Chick Association Convention to effect final revisions which would give a plan acceptable to this poultry industry of the whole country.

State representatives of the thirteen northeastern States, meeting at College Park on August 15th as a special committee of the Northeastern Poultry Producers Council, reviewed in detail the plan as amended at Chicago and made several recommendations to the Federal Government concerning its provisions.

The plan as now constituted was issued by the Federal Government in September, 1935, as A. H. D. No. 14 mimeo. circular from the Animal Husbandry Division of the Bureau of Animal Industry in Washington.

In late August, 1935, the Maryland Poultry Certification Board, which was about to inaugurate the official breed improvement and Pullorum testing work in Maryland for the 1935-36 season, revised the Maryland Poultry Standardization and Disease Control Plan to conform to the revised national plan. The board also gave consideration to the recommendations of the Northeastern Poultry Producers Council which were drafted at College Park on August 15th.

On October 1, Mr. Berley Winton, extension poultry specialist in Missouri, was appointed supervisor of the National Poultry Improvement Plan, and on December 1, Mr. P. B. Zumbro of Ohio was appointed as assistant.

These gentlemen recently met with the Maryland Poultry Certification Board to determine the status of this work in Maryland and the adjustment necessary for Federal cooperation and recognition.

This conference indicated that little difficulty exists in effecting a memorandum of agreement to complete the arrangements for Federal-State cooperation in this work in Maryland.

It is therefore anticipated that official poultry improvement and Pullorum disease testing in Maryland will have Federal recognition in the near future to become effective for the 1936 breeding and hatching seasons. Ten commercial hatcheries and about twenty breeders in Maryland involving 116,540 birds on 353 farms are engaged in official Pullorum disease testing for 1936. Of this number, seven hatcheries and breeders are engaged in the first breed improvement stage known as approved and two breeders with 2,290 birds are in R. O. P. work. No breeders are engaging in the second and third stages known as vertified and certified. This is principally due to lack of R. O. P. males in Maryland. Maryland breeders engaged in trapnest and pedigree work have in the past exhibited a rather indifferent attitude towards securing official recognition of their breeding operations, while breeders in many other States have been making names for themselves and made their States famous as a source of stock

of high egg breeding qualities through their R. O. P. Breeders Associations.

The development of R. O. P. interest and activity among breeders in Maryland is a matter of first consideration to this committee. With only one or two breeders in R. O. P. work in Maryland out of at least twenty-five who are practicing trapnesting and pedigreeing, is a condition of which neither breeders nor the industry can well be proud.

Conclusion

Due to the pressure of organization and extension project activities upon the present chairman of this committee, he is not in a position to give this work the time it requires for effective advancement.

His resignation as chairman is therefore tendered at this time, with the suggestion that Mr. P. A. Raper who is in direct charge of breed improvement details for the Maryland Poultry Certification Board and has no committee assignment nor office in the Maryland State Poultry Council, be appointed at chairman of the Committee on Breed Improvement. The present chairman will, of course, be glad to serve as an advisory member of the committee and contribute to its work as far as time and other duties will permit.

REPORT OF THE ECONOMIC STABILIZATION COMMITTEE

By DR. S. H. DEVAULT
Chairman

The Committee on Economic Stabilization of the Poultry Industry in Maryland has chosen as its project for 1936 the completion of the study of the production, consumption, exports, and imports of eggs in Maryland by local areas, which was inaugurated in 1935.

During the year just past, some progress was made in obtaining information in relation to the above-mentioned project. Information has been obtained from marketing agencies, poultry specialists familiar with the areas of production in the State, county agents, and others. The information we have collected is only preliminary and is subject to refinement later. The aim of the committee is to check the data obtained in every way possible and to refine the information by further research. Information will be obtained from the marketing officials in Baltimore, Philadelphia, New York, Boston and Washington, D. C., in regard to the receipts of eggs on these markets from Maryland.

The production of eggs in Maryland, according to the 1930 census reports is 27,709,334 dozens, and the human consumption of eggs is 28,551,712 dozens, leaving a deficit for the State of 842,378 dozens. Of the eggs consumed in the State, 9,277,984 dozens are supplied from within the counties and 19,273,728 dozens are shipped in from outside. In other

words 67½ per cent. of the eggs consumed in Maryland, including Baltimore City, are shipped in. Omitting Baltimore City, of the eggs consumed in the counties, 9,240,579 dozens are produced in the counties and 5,225,838 dozens are shipped into these counties. The eggs shipped out of the counties of Maryland are equivalent to 18,431,350 dozens. There are produced in Maryland, excluding Baltimore City, 27,671,929 dozens of eggs; 14,466,417 dozens are consumed in this area, of which 9,240,579 dozens come from local sources, leaving 18,431,350 dozens shipped out. About two-thirds of the eggs produced in the counties are shipped out, and a little over two-thirds of the eggs consumed in Maryland, including Baltimore City, are shipped in.

The chief egg shipping areas are Carroll and Frederick Counties, with a shipment of 4,180,000 dozens; Baltimore and Harford Counties, with a shipment of 2,914,000 dozens; Caroline County, with a shipment of 1,369,651 dozens; and Wicomico, Worcester and Somerset Counties, with a shipment of 4,260,000 dozens.

The above figures do not take into consideration the eggs incubated by natural or artificial means. An estimate of eggs incubated in Maryland is 11,616,000 eggs, or 968,000 dozens. In the main broiler producing area of the State the apparent surplus of eggs for human consumption would be materially reduced by the quantity used by the hatcheries. Adding the egg requirements of the hatcheries and farms in the State to the deficit of eggs for human consumption, gives a total deficit of 1,810,000 dozens in the State.

The receipts of eggs at Baltimore in 1934 were 11,640,780 dozens, and the receipts in 1935 were 13,163,100 dozens. The receipts of eggs at Baltimore from Maryland in 1934 were 2,130,450 dozens, and in 1935, 2,998,890 dozens. In 1935 about 21 per cent. of the eggs consumed in Baltimore were received from Maryland.

Receipts of Eggs at Baltimore from Maryland, 1934 and 1935

Month	1934 Eggs (Cases)	1935 Eggs (Cases)
January	3,926	3,034
February	4,224	5,344
March	8,955	18,948
April	13,745	18,566
May	10,810	17,324
June	6,318	9,070
July	5,334	6,502
August	4,711	5,401
September	3,189	4,196
October	3,567	3,614
November	3,274	4,464
December	2,962	3,500
Total	71,015	99,963
	2,130,450 doz.	2,998,890 doz.

Receipts of Eggs at Baltimore, 1934 and 1935

Month	1934 Eggs (Cases)	1935 Eggs (Cases)
January	17,044	17,400
February	23,738	25,122
March	40,889	50,001
April	45,115	52,741
May	49,264	58,919
June	52,353	48,514
July	30,337	37,158
August	27,639	26,847
September	23,116	28,118
October	24,489	34,834
November	30,361	33,116
December	23,681	26,000
Total	388,026	438,770
	11,640,780 doz.	13,163,100 doz.

Egg Production and Consumption in Maryland

County	Eggs Produced	Eggs Consumed			Eggs Shipped Out	Surplus or Deficit
		Local	Shipped In	Total		
	(11)	(12) 3+9	(13) 4+10	(14)	(15) 11-12	(16) 11-14
Allegany	274,760	410,122	974,093	1,384,215	135,362	— 1,109,455
Garrett	832,512	296,948	51,443	348,391	535,564	484,121
Washington	1,327,974	865,841	287,093	1,152,934	462,133	175,040
Area I	2,435,246	1,572,911	1,312,629	2,885,540	862,335	— 450,294
Carroll	3,406,636	579,626	49,990	629,616	2,827,010	2,777,020
Frederick	2,101,805	748,892	203,809	952,701	1,352,913	1,149,104
Howard	741,754	160,838	122,120	282,958	580,916	458,796
Montgomery	1,295,735	420,100	441,005	861,105	875,635	434,630
Baltimore	2,770,295	1,056,890	1,122,997	2,179,887	1,713,405	590,408
Harford	1,583,865	383,430	169,623	553,053	1,200,435	1,030,812
Cecil	837,653	301,709	150,264	451,973	535,944	385,680
Area II	12,737,743	3,651,485	2,259,808	5,911,293	9,086,258	6,826,450
Anne Arundel	649,334	456,979	508,444	965,423	192,355	— 316,089
Calvert	159,183	145,639	21,102	166,741	13,544	— 7,558
Charles	428,112	254,055	28,850	282,905	174,057	145,207
Prince George's	1,055,192	486,943	564,719	1,051,662	568,249	3,530
St. Mary's	426,955	228,438	37,370	265,808	198,517	161,147
Area III	2,718,776	1,572,054	1,160,485	2,732,539	1,146,722	— 13,763
Caroline	1,658,710	289,059	15,214	304,273	1,369,651	1,354,437
Kent	544,825	228,582	20,653	249,235	316,243	295,590
Queen Anne's	679,464	236,003	18,990	254,993	443,461	424,471
Talbot	610,778	267,024	58,179	325,203	343,754	285,575
Area IV	3,493,777	1,020,668	113,036	1,133,704	2,473,109	2,360,073
Dorchester	932,499	329,784	139,444	469,228	602,715	463,271
Somerset	1,432,450	346,994	62,191	409,185	1,085,456	1,023,205
Wicomico	1,646,763	426,254	120,254	546,508	1,220,509	1,100,255
Worcester	2,274,675	320,429	57,991	378,420	1,954,246	1,896,255
Area V	6,286,387	1,423,461	379,880	1,803,341	4,862,926	4,483,046
State Total, excluding Baltimore City	27,671,929	9,240,579	5,225,838	14,466,417	18,431,350	13,205,512
Baltimore City	37,405	37,405	14,047,890	14,085,295	.....	—14,047,890
State Total	27,709,334	9,277,984	19,273,728	28,551,712	18,431,350	— 842,378

Sources of Eggs Consumed in Maryland

Sources of Eggs Consumed in Maryland

	FARM				NON-FARM					
	Population	Total Eggs Consumed	Eggs Consumed From Local Sources	Eggs Shipped In	Population	Percent, Consumed From Local Sources	Percent, Consumed From In Shipments	Total Eggs Consumed	Eggs Consumed From Local Sources	Eggs Shipped In
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8) 5x17½	(9) 8x6	(10) 8x7
Allegany	5,230	91,525	86,949	4,576	73,868	25	75	1,292,690	323,173	969,517
Garrett	10,187	178,273	169,359	8,914	9,721	75	25	170,118	127,589	42,529
Washington	13,437	235,148	223,391	11,757	52,445	70	30	917,786	642,450	275,336
Area I	28,854	504,946	479,699	25,247	136,034	....	....	2,380,594	1,093,212	1,287,382
Carroll	14,825	259,438	246,466	12,972	21,153	90	10	370,178	333,160	37,018
Frederick	18,743	328,003	311,603	16,400	35,697	70	30	624,698	437,289	187,409
Howard	7,355	128,713	122,277	6,436	8,814	25	75	154,245	38,561	115,684
Montgomery	11,306	197,855	187,962	9,893	37,900	35	65	663,250	232,138	431,112
Baltimore	19,214	336,245	319,433	16,812	105,351	40	60	1,843,642	737,457	1,106,185
Harford	13,575	237,563	225,685	11,878	18,028	50	50	315,490	157,745	157,745
Cecil	7,589	132,808	126,168	6,640	18,238	55	45	319,165	175,541	143,624
Area II	92,607	1,620,625	1,539,594	81,031	245,181	....	....	4,290,668	2,111,891	2,178,777
Anne Arundel	11,341	198,468	188,545	9,923	43,826	35	65	766,955	268,434	498,521
Calvert	5,881	102,918	97,772	5,146	3,647	75	25	63,823	47,867	15,956
Charles	10,564	184,870	175,627	9,243	5,602	80	20	98,035	78,428	19,607
Prince George's	15,072	263,760	250,572	13,188	45,023	30	70	787,902	236,371	551,531
St. Mary's	8,309	145,408	138,138	7,270	6,880	75	25	120,400	90,300	30,100
Area III	51,167	895,424	850,654	44,770	104,978	....	....	1,837,115	721,400	1,115,715
Caroline	8,809	154,158	146,450	7,708	8,578	95	5	150,115	142,609	7,506
Kent	4,880	85,400	81,130	4,270	9,362	90	10	163,835	147,452	16,383
Queen Anne's	7,439	130,183	123,674	6,509	7,132	90	10	124,810	112,329	12,481
Talbot	6,606	115,605	109,825	5,780	11,977	75	25	209,598	157,199	52,399
Area IV	27,734	485,346	461,079	24,267	37,049	....	....	648,358	559,589	88,769
Dorchester	7,877	137,848	130,956	6,892	18,936	60	40	331,380	198,828	132,552
Somerset	7,484	130,970	124,422	6,548	15,898	80	20	278,215	222,572	55,643
Wicomico	9,988	174,790	166,051	8,739	21,241	70	30	371,718	260,203	111,515
Worcester	10,461	183,068	173,915	9,153	11,163	75	25	195,352	146,514	48,838
Area V	35,810	626,676	595,344	31,332	67,238	....	....	1,176,665	828,117	348,548
State total, exc. Balto. City	236,172	4,133,017	3,926,370	206,647	590,480	....	....	10,333,400	5,314,209	5,019,191
Baltimore City	.....	.....	.....	.....	804,874	0.27	99.73	14,085,295	37,405	14,047,890
State total	236,172	4,133,017	3,926,370	206,647	1,395,354	....	....	24,418,695	5,351,614	19,067,081

REPORT OF COMMITTEE ON FEEDING AND NUTRITION

By ROY H. WAITE
Chairman

Your Committee on Feeding and Nutrition has had assigned to it the problem of "Feeding and its relation to the control of coccidiosis". There has as yet been no opportunity to work on this project since the meeting last summer. It is hoped that several angles to the problem may be investigated during the coming brooding season.

It may be appropriate at this time to mention the investigations that have been carried on with certain types of grit during the past year, at the University of Maryland Experiment Station. Among some of the interesting findings are the following:

We found that "hens apparently have little difficulty in dumping any excess of limestone, oyster shell, or other grit that they may consume, by passing it out with the droppings". This explains a peculiar circumstance that has puzzled investigators for sometime, i. e., how hens could maintain production, and put good shells on eggs, with a smaller consumption of limestone than of oyster shell under similar conditions. The answer seems to be that an excess is consumed and what is not needed is spilled "overboard" with the droppings.

We found that limestone grit dissolved out of the gizzard in about forty-eight hours in the case of a hen in laying condition.

A type of granite grit used as a check on the limestone disappeared almost as rapidly as the limestone, due to shattering. A "Mechanical Gizzard" was designed for testing hardness of grit. A pebble grit manufactured in Baltimore proved hardest of all the samples tested. A sample of blue limestone from a Martinsburg, W. Va., quarry was second, and hardest of all the quarried materials tested. Crushed oyster shell stood up better than any of the granite grits tested, being fourth in hardness among the nine samples tested. A widely advertised granite grit proved softest of all the grits tested.

These results have been published in bulletin form, Experiment Station Bulletin No. 377, and have attracted nation-wide attention. Additional investigations are being conducted to clear up other angles of problems that have presented themselves.

Baltimore, Md., January 15, 1936.

REPORT OF COMMITTEE ON DISEASE CONTROL

By DR. H. M. DEVOLT
Chairman

For the benefit of those who have not been familiar with the formation of this committee I wish to review briefly its history to date.

The committee chairman was named at the winter meeting of the Poultry Council in 1935. Dr. F. W. Cruickshanks of Hagerstown and Mr. Claude E. Truslow of Chestertown were appointed later to make a committee of three representing the interests of the practicing veterinarian and breeder hatcheryman, respectively.

In the beginning it seemed that the function of this committee might well be to cooperate with the Livestock Sanitary Service in furthering certain phases of its work. In view of the large volume of blood testing work that came to our laboratory during the fall, however, your chairman has been unable to initiate any further action in the work of the committee.

At the present time, after conferring with the various department heads concerned here at the University and with Mr. H. D. Copeland, representing the Poultry Council, your chairman proposes a new activity for our Poultry Disease Committee. This activity is to formulate a questionnaire for the purpose of obtaining information about the disease problems confronting the poultrymen in this State. In taking this action, we plan to enlarge the committee to include one representative from practically every county in the State.

This constitutes the plan of work which will engage this committee during the spring months and it is hoped that the efforts of all concerned will result in a worthwhile contribution. Those present at the meeting of the council on January 15 in Baltimore were asked particularly to comment upon the activities of this committee.

EDUCATION AND RESEARCH COMMITTEE REPORT

By GEORGE D. QUIGLEY
Chairman

The Committee of Education and Research of the Maryland State Poultry Council, composed of Mr. Ralph Nestler, Bureau of Animal Industry Farm, Beltsville, Md.; Mr. Thos. Bourne, Millington, Md.; Mr. Ira Langeluttig, Churchton, Md.; and Mr. Geo. D. Quigley, College Park, Md., has selected for its particular research problem a study of the relationship between yolk color and food value of eggs. While it is the plan of this committee to concentrate mainly upon this problem, it is considered that

the nature of the problems closely allied with yolk color, including consumer preference, vitamin content of eggs, mineral content, and candling problems should also receive consideration.

To date the activity of the committee has consisted mainly in the examination of research work already performed upon these subjects. This survey of past research reveals that the subject of yolk color and its connection with food value has been investigated in a number of segments, but that at present no definite conclusions can be drawn. The various gaps existing between the portions of the field which have been investigated to date will apparently be filled only by rather extensive research covering a period of time. At present, the only conclusion which seems safe to venture is that yolk color and food value are not necessarily connected, but since this conclusion makes no allowance for the element of probability, it is recommended that temporarily no reliance be placed upon such by the poultryman.

The committee advises that in connection with a University of Maryland project for studying the vitamin value of eggs that progress has been made. A survey of all important research dealing with this subject has been completed. Report of further progress will be made when suitable to the persons involved.

This committee has made contacts with a view toward studying consumer preference for eggs in our Maryland markets with a view toward comparison with other surveys made in large consuming centers. To date this is a projejct which must wait proper opportunity and funds.

While the foregoing problems seem to your committee to be the most important along the lines of investigation attempted, it is realized that we must not lose sight of the industry as a whole. Accordingly, developments in the science of candling which is closely allied to interior egg quality will be watched from time to time and reports made.

Your attention is directed to recent research along poultry lines by your University Experiment Station. Bulletin 377, by Roy H. White, entitled "Miscellaneous Studies on Poultry Grit", devoted mainly to a study of pebble, limestone, oyster shell, and granite grits, has added considerable to the industry's knowledge along these lines and has caused much comment. Of especial interest was a new machine method developed for testing of grit materials. A new bulletin is now in print covering certain production phases of the broiler industry.

REPORT OF THE RESOLUTIONS COMMITTEE

By MRS. W. W. HOPKINS, Chairman

The Chairman of the Resolutions Committee begs to submit the following report of activities of their committee during the past year.

Two resolutions repsented and passed at the Annual Summer Meeting, College Park, August 13, 1935.

1. Expression of appreciation to Acting President Byrd, Poultry Specialist, County Agents and other members of the Extension Service for assistance rendered during summer meeting.

2. Endorsing and pledging support of the proposal made by Dr. Welsh for B. W. D. control work in Maryland.

A resolution was presented and passed at the Northeastern Conference urging food authorities to distribute more information concerning the food value of Poultry and Poultry Products.

Resolution proposed making certain recommendations regarding National Breeding Plan.

Letters containing resolutions urging the Governor, Senators and Representatives to support H. B. 174 and H. B. 175, Fresh Egg Laws, were sent to these officially.

In addition to these—Resolutions were sent to U. S. Senators and Representatives urging their support on the following legislation affecting the poultry industry of Maryland, H. R. Bill 5802, Excise tax on Chinese eggs and egg products.

S. B. 2805 reference to control of advertising of poultry remedies placing H. R. Bill 2228—relative to National policies and appropriation for Extension Work.

Resolution

WHEREAS: The Poultry Industry of the State has been directly and substantially benefited by the Pullorum disease eradication work, and

WHEREAS: Poultry Producers heretofore have not on the whole felt financially able to take hold of the testing.

Be It Resolved, By the Maryland State Poultry Council that we express our sincere appreciation and thanks to the State Board of Agriculture the Livestock Sanitary Service, the Poultry Departments of the University of Maryland and especially to Dr. Mark Welsh for his cooperation and service rendered in making the service available to the poultrymen throughout the State.

THE FRESH EGG LAW TO DATE IN MARYLAND

By W. H. RICE
Extension Poultry Husbandman

The Maryland Fresh Egg Law as passed by the Maryland General Assembly on April 1, 1935, was approved by the Governor on May 16th and became a law on June 1st, 1935.

The relationship between the Maryland Quality Egg Program, which was outlined as an Extension sub-project early in 1935, and the educational work on the Fresh Egg Law, is so close as to make the work on the two practically inseparable in a discussion on Egg Quality Improvement Work.

The Quality Egg Program is designed as an aid and guide to Maryland farmers and poultrymen in improving the quality of eggs they produce and market in order to eliminate economic waste and increase egg profits. The Quality Egg Program therefore deals primarily with problems of low egg quality at the source of production. It is most fundamental in nature since egg quality cannot be improved after the egg is laid.

The Fresh Egg Law, on the other hand, approaches the problem of low egg quality primarily from the standpoint of protecting the consumer, though all agencies concerned in production and distribution of eggs are naturally involved.

Educational work concerning the Fresh Egg Law therefore necessarily involves both of these standpoints in approaching the problem of low quality eggs in Maryland.

Since the appropriation for enforcement was not made as provided in the fresh egg law, the desire for educational work on the part of individuals or groups has had no stimulus from within, other than of a voluntary nature prompted by personal interest in the economics involved.

This condition makes for a job that is fraught with every sort of difficulty which characterizes human nature; a job that calls for a long time program and concentration of effort and ingenuity, as reformers are not pouplar among those to be reformed, unless the advantage or profit in the new order can be forcibly demonstrated. It is not easy to find and strike the right chord in just the right manner to get action.

Nevertheless, what other States have done, Maryland can do, provided the will power, man power and brains to do the job is available to tackle it.

Shortly after the introduction of the Fresh Egg Law into the Legislature last February, the demand from various groups upon the specialist for information on the provisions of the law and its significance to them became heavier than one man could possibly handle. With Mr. P. A.

Raper assisting, more than 40 meetings with more than 1,100 people present were attended and addressed on egg quality and the Fresh Egg Law in about 60 days. The pressure of other work prevented arranging for additional meetings which could have been arranged under a campaign type of program, carefully planned and executed.

A mimeographed circular on "Quality Eggs from Producer to Consumer" was prepared and issued to over 1,000 people in the State during June. This circular was superseded by Extension Circular No. 111 of the same title which became available about August 1st. About 5,000 copies of this circular have been distributed throughout the State.

Also, in numerous conferences with individual producers, consumers and officials, every available opportunity of creating egg quality consciousness has been taken advantage of to further the cause with every influential individual.

In these conferences, lists of questions relative to egg quality and the Fresh Egg Law were secured from producers, wholesalers, retailers, and consumers of eggs.

These questions were designed to serve a three-fold purpose. First, to furnish material for discussion in group meetings of the various interests concerned in the problems of egg quality and the Fresh Egg Law. Secondly, to serve as the basis for radio dialogue discussions presented over Station WBAL, Baltimore. Third, to furnish material for a circular of questions and answers on the subject for publication and distribution throughout the State.

The questions have been used for discussion in various meetings which have been held.

The radio dialogue material was prepared and presented as planned, with several organizations and individuals cooperating.

These radio broadcasts have been mimeographed, bound and distributed to about 500 leading producers, wholesalers, retailers, and consumers in the State. This material should aid in developing egg quality consciousness in Maryland and promote support for the law.

The circular on questions and answers on egg quality and the fresh egg law has not yet been prepared, due to the pressure of other lines of work. It is planned to issue this circular as soon as time will permit its preparation and printing.

Conclusion

It is believed that the educational material in the form of literature, radio broadcasts, etc., has reached the thinking group of leaders in production, wholesale and retail interest to a satisfactory degree. However, getting this material to consumers is a matter of immediate attention.

The work with the Fresh Egg Law has now reached the stage when promotional and organization work is required to secure real results and make the law truly effective with consumers. This is the job that requires man-power to accomplish. What will be accomplished along these lines in 1936 will largely depend upon the time the present workers are able to devote to the work along with other lines of work which are pressing for attention, and whether or not funds for enforcement of the law are provided.

To further the educational work of the law in an effective manner, during 1936, will require either additional man-power on poultry extension education, or dropping other lines of work in extension projects or poultry organization work by the single man now employed.

A really effective job on this line of work requires at least the full time of one worker. Without a full time worker to take over this work not only this but other lines of poultry extension education in the State will fail to advance as they should in 1936.

EDUCATION OF THE PEOPLE REGARDING THE FRESH EGG LAW

By DR. T. B. SYMONS
Director, Extension Service
University of Maryland

Wednesday, January 15, 1936.

With the passage of the Maryland fresh egg law by the last Legislature, every effort has been made by the Extension Service with our limited means to inform the people of Maryland concerning the factors surrounding this law. Education work concerning the fresh egg law necessarily involves the education of the producer in improving the quality of the egg as well as the consumer as to the type of egg that he should look for.

More than forty meetings have been held in various sections of the State and have been addressed by the specialists of our service on egg quality and the fresh egg law. Considerable material has been distributed concerning quality of eggs from producer to consumer. Numerous conferences with producers, consumers and officials have been held with a view to informing all classes concerning problems of egg quality and the enforcement of the law. Radio broadcasts have been given and special plans are now under way for enlisting the cooperation of all interests so that when funds are provided for the enforcement of the law it will proceed as easily as possible.

Several States to the north of us have enacted fresh egg laws and are succeeding in their enforcement and we hope that Maryland will do likewise.

Every effort is being made with our limited funds to advance the interest of more efficient production and grading of eggs. We recognize that our producers must be educated along this line as well as the consumers. The impetus given by the passage of the fresh egg law, we hope, will serve to promote the industry in many directions. I trust that we will be able to put on an assistant to aid Mr. W. H. Rice, who has been carrying the heavy load to meet the demands of this new work.

We are making splendid progress in disease control, which will have its effect, I believe, in improving our standards of poultry and in turn lead our producers to appreciate the value of proper feeding and subsequent production of better eggs.

To revolutionize the industry will require a tremendous amount of educational effort.

We are cooperating vigorously with the State Poultry Council in every way to stimulate interest among various groups as to the potential possibilities of increasing the consumption of eggs by first convincing the consumer of the quality of the product. We must confess that we have only made a start in this direction, but there has been a fine response from the various promotional plans that have been inaugurated.

TURKEY PROBLEMS IN MARYLAND

By DR. H. M. DEVOLT
Specialists in Poultry Diseases

(A summary of material presented at the Turkey Growers Conference held in Baltimore on the evening of January 16, 1936.)

As far as current reports are concerned, the disease problems of the Maryland turkey producers appear to be quite similar to those of producers in other States and sections of this country. A possible exception to this statement may exist in the reported disease of unknown origin that menaced the Virginia industry throughout the past summer. A definite diagnosis of this ailment apparently has not been forthcoming from the officials concerned. Certainly, in Maryland we have seen no such extensive trouble. Individual cases have been called to our attention recently of a complaint which may be in the class with the trouble reported in Virginia.

As compared with the troubles of other poultrymen, I believe the turkey growers have their full share. Although there are actually fewer ailments recorded in connection with our turkey losses it appears that a few diseases are responsible for more wide-spread and serious trouble. This state of affairs would seem to be a result of the tenderness of young turkeys as well as their relatively short tenure in domestication.

Before outlining the cause, nature and control of some of the common turkey diseases, I wish to mention briefly some phases of the general health program.

For purpose of discussion it is convenient to divide the health program into three parts. Thinking of these as three blocks constituting a monument, I like to place at the bottom a block called, inherited stamina and vigor. This block is fundamental and certainly nothing will overcome its absence. The next block may be called general sanitation and would include such measures as yard rotation, systematic house cleaning, the provision and maintenance of the clean supply of food and water and the removal of sick birds. The third block may be called specific therapy and includes both biological tests and immunizing agents for use against certain diseases. Because of the fact that such tests are not available for all diseases, it is necessary to keep the general sanitary measures in force constantly. Fortunately, however, the specific therapeutic agents are more far-reaching than general sanitary measures in those cases where they can be applied.

A discussion was then given of such well-known ailments as Pullorum disease, coccidiosis, blackhead, fowl pox, rickets, paratyphoid infection and others.

TURKEY MARKETING PROBLEMS

By MRS. G. W. SATTLER

Madam chairman and fellow turkey raisers, do we realize that the marketing of turkeys is a problem? We have spent our money, our time, of hours, of weeks and even of months in raising turkeys but how much time have we spent on the marketing of our birds? We raise our turkeys to make money, yes, to make hard cash. It is a great joy to see the little fellows grow and shoot their beautiful feathers but we defeat our object if we do not see our bank accounts grow. It sounds easy to get the highest prices for our turkeys. We just wait until the market is high and then all of us, all at once, shoot them into the high market. What happens? Why, as we all know, the bottom falls out of the market, the price drops and the returns are anything but that we had anticipated. No, it cannot be done in that way. There is only one time to sell a turkey and that is when it is in prime condition. Regardless of market price, the turkey should be put on the market as soon as it is prime. At that period, the bird commands top price or a premium, after that time it does not gain economically and before that time it is making money for us. There is no question but that in the long run our returns will be greatest if we only market our prime birds.

We can sell these prime birds either wholesale, viz., in quantities or retail. In wholesale selling, the most desirable outlet is the store or

individual that caters to high-class trade. There we have no commission to pay, we get home weight, and we always get the highest market price and usually a premium. Each week or twice each week our birds are sent for and those that are in top condition are chosen. However, we are under an obligation to the customer; we must see that he gets only the very best, for he is paying us a premium and expects something special from us. He, in turn, passes the extra charge on to his customers who are only willing to pay the extra price provided they are confident the birds will be top notch. There is only one great trouble with this kind of selling; there are not enough of these stores or individuals with a high-class clientele. Lucky is the producer who has such an outlet and has sense enough to hold on to it by giving of his best!

Another wholesale outlet is the huckster. He wants to buy at the lowest figure for he hopes to resell his purchases and make money. Sometimes he will take your entire flock at a ridiculously low figure; again, he may offer a fair price if allowed to select the birds he wants, but they are always the most popular weights and most desirable birds. His weights are also to be considered. Does he weigh the birds en masse or one at a time, lopping off an ounce or two on every bird? Also has the huckster's scales been lately tested? By the way, may I ask whether we have our scales tested before each marketing season. I know I always have mine tested. If we don't, we may cheat our customers or we may cheat ourselves. I am not insinuating that the huckster is dishonest but I think we have safer and surer markets.

The commission man is another wholesale outlet. I know we all say, "Oh, anything to avoid that awful commission"! Yet I wonder whether we do not under-estimate the value of the commission men. They are the contact men; they have the buyers. It is their business to bring together the producers and buyers. Now I am referring only to the reliable men whose credit is good, to men who have been in business for many years. However, we must do our part and be honest with them and tell them the kind of birds we have to sell. If we have old hens, old Toms, young hens, young Toms, ones well fleshed or full of greasy fat, we must tell what they are and the proper buyer can be found. The Jews prefer and will buy at a premium the overly fat, and the best houses will pay above market price for the well fleshed. There is a place for all well-shaped, well-fed turkeys sold in their prime and the commission men can place them to advantage if we play a fair game. We must prepare for the sale of our turkeys so that they will not have to stand on the street in coops piled upon coops, losing weight and losing money for us. First, we must contact these men by phone, letter, or in person and tell them the kind and number of turkeys we have for sale and ask them to tell us when to ship our turkeys. They will find a market for they want our business. The turkeys, the minute they arrive, can be transferred from your truck to the truck of the buyer, thus insuring

a minimum loss of weight. Again I say we must not send our turkeys to the market unless they are sold by the commission men before they leave our farm.

Omitting the pool selling of turkeys which is not successfully done in the locality of big cities, we come to the retail marketing. There, in the retail business, the most money is made, but—oh, but—if we haven't time, patience, and self-control we might as well not try it. We cannot make a success unless we master the idea that the customer is always right. Perhaps if I give an outline of our own retail business, the many problems connected with it will be seen. Customers ask for such queer weights. One will want a six-pound pullet which I will not sell and the next will order an eighteen-pound dressed pullet which we will not possess. It is almost impossible to satisfy customers on weights so we have decided to sell nothing but prime birds; pullets that dress ten pounds and up, and goblers that dress sixteen pounds and over. If we sell under these weights, the birds do not look well and the customers will get proportionately too much bone for the amount of meat. We may lose a customer now and then, but we would rather lose a satisfied customer than a dissatified one. We require our turkeys to be good eating and good looking. They are all dry picked. No water comes near them so there is no chance of our customers buying water; they buy all turkey. We always see that our birds are fasted from eighteen to twenty-four hours before killing so that their crops and intestines are empty, thus insuring better weight and a better flavor to the meat. The turkeys must be properly stuck through the mouth and bled and the feathers loosened by piercing through the roof of the mouth. The picking and pinfeathering are completed while the birds hang. They are then hung in the cooling room where there is a free circulation of air. We prefer our birds to season, to hang four to five days before cooking. We always ask our customer when the bird is to be eaten so we can figure on the proper time to kill. Of course, by request, we have to kill some the day before they are eaten and some have to be drawn while hot, but we gladly do whatever is asked. When the birds have hung, we weigh them and examine them for any defects. All carcasses that are not perfect, that have bruises, scuffs or tears are culled out and sold as seconds at a few cents per pound reduction. The best are drawn, neatly wrapped in cellophane or waxpaper and put in their containers, bags or boxes. The birds are then ready for delivery.

All goes well until we come to Thanksgiving, Christmas and New Year's, and then we have a hectic rush. All prefer their turkeys at noon before the holidays, but of course that is impossible. We run three cars for delivery and sometimes people are so cranky we have to deliver a turkey to one house one day and to the next-door house the next day, just because the refrigerator will not hold the turkey overnight. We smile sweetly and deliver the turkey, but we boil inwardly.

We also have our troubles. Cooks are terrible stumbling blocks and

have to be treated with kid gloves. For example, this year we sent a lovely eleven-pound dressed pullet to a customer. The cook received it, punched its breastbone and, because it did not bend to her taste, said it was an old hen and sent it back without the lady of the house even getting a squint at the bird. Another time we delivered a young Tom, twenty-five pounds dressed, to Mrs. W. The portly colored cook rolled her big eyes at the bird, shook her head and said to the truck driver, "I'se from Virginy. I'se knows turkeys. I'se know dat an old turkey fer no young 'uns gets big as dat. You can't fool me. I'se from der country"! Fortunately, the driver left the turkey but I got a phone message from the head of the house. We assured her it was a young bird so she kept it. It was a howling success, but I feel certain the cook did all in her power to try to make the turkey tough. Once we had a queer complaint; one-half the turkey was delicious and the other side was tough. It was not properly cooked, as we all know, but take our advise and don't even try to explain the trouble.

Weights are another stumbling block. Some people are such tightwads—yes, these had plenty of money. One objected to my sending an eleven-and-one-quarter-pound pullet when she had ordered one between ten and eleven pounds. People seem to think a pound of turkey meat can be stuck on or cut off at their bidding. Then we hear the old complaint, "I ordered and paid for a sixteen-pound dressed turkey, and I weighed the turkey and it only weighs thirteen pounds." Of course, it only weighed thirteen pounds drawn, just what a sixteen-pound dressed turkey should weigh. Lately we have had little trouble about our drawn weight as we carefully tell each new customer, and repeat and repeat that the dressed weight is the weight before the turkey is drawn, that we weigh the turkey before we draw it.

Life on the farm just before and during the holiday season is hectic. We sell turkeys at live weight but all birds are killed before they leave the place unless they are sold at breeder prices. People come for their turkeys at all hours. Before six a. m. we have been routed out of bed to wait on customers. Men on their way to work, stop for their turkeys and leave them at sister's, or mother-in-law's, as they pass by. Again, many times at midnight, we have been picking birds off the roosts for customers in the blaze of the floodlights. I especially remember one midnight crowd, a gay bunch, mostly under the weather, who wanted four turkeys, each just to tip the scales at twenty-five pounds and to be exactly alike. We caught turkeys and caught turkeys until we were nearly exhausted; this one would be heavier than Jake's or lighter than Salley's. Finally we satisfied them, and they were so pleased they became generous and offered us a little nip.

It seems to be a great lark for people to go to the country to order their turkey for Thanksgiving, Christmas or New Year's. The cars just seem to spring up on the lawn and there are so many people the place

looks like a park. They come by the carloads with children and grandchildren. The little ones are frightened by or thrilled with the turkeys. They make them gobble and chase them around and around. Grandpa or dad brings his camera and takes pictures of his offspring in the midst of the turkeys or riding a pony or horse. Children dart here and there, even go to the barn for a roll in the hay or a glimpse of the cows being milked. They ruin their Sunday best by falling in the barn yard and have to be washed off, or they cut their knees or hands and have to be "mercurochromed". Then grandma gets cold and has to be warmed up by the open fire. There are strangers everywhere. Now we are not complaining, we want the people to come and have a good time but we are saying that before and during the holidays our own peaceful home disappears.

By now, I hope we can see that there are problems connected with this turkey marketing game whether it is wholesale or retail. However, it is the same old story, the more one puts into a thing the more one gets out of it.

ECONOMIC ASPECTS OF MORTALITY IN POULTRY

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There are two important factors in the poultry industry that have a great bearing on whether we end the year showing a profit or a loss. These are mortality and marketing. Mortality is the first to consider because we have to have a live and healthy bird before we can expect to get eggs or have birds to sell. A pathologist from one of our leading universities stated recently that there was a mortality of 40 per cent. in poultry each year in the United States. This figure seems high at first, but considering the fact that the poultry population consists of all birds from hatching up to those that die of old age, and they are liable to die at any age, this figure sounds reasonable.

A few examples of what mortality may cost the poultryman is the best way to impress its importance on the flock owner. For instance, suppose the poultryman puts out 1,000 baby chicks and at the age of eight or ten weeks he could sell, 500 males for enough to pay for the original cost and the rearing of the entire 1,000. This would leave him 500 females free, to speak, at this age. Now, if he lost 20 per cent. of these he would have lost the sale of 100 males and would have 100 less females to keep. Besides, every bird lost makes the average cost of those left higher and if this runs too high the income from the sale of the males would not meet the cost so as to give the ten weeks old "free pullets".

The Department of Agricultural Economics, University of Maryland, has gathered some very interesting data (as yet unpublished) on broiler production. These figures show that 109 broiler plants over a twelve-month period put out 1,078,580 chicks, of which 181,242 died. Supposing these chicks cost 10 cents each. That would mean these plants lost $18,124.20 of the money they had to put out in the beginning. The cost of feeding, housing, etc., up to the various ages of the deaths of these birds runs the loss to the growers through mortality up into thousands of dollars annually. This data also shows many of these plants made a profit while others showed a severe loss, and in practically every case of a loss there was a high mortality in the flock.

In considering the flock owner who keeps birds for laying purposes, suppose he put 1,000 pullets in the laying house in the fall. Valuing these birds at $1 each would mean $1,000 worth of birds. If there should be a 20 per cent. loss it would mean a loss of $200 worth of birds. If these 200 birds had lived and had averaged 10 cents per bird profit each month as the other 800 birds did, it would mean the loss of from 10 cents to $1.20 per bird from egg production alone, depending on how soon the bird died after being housed. Using the above figures as a criterion every bird lost may mean a loss of from $1.10 to $2.20 to the flock owner.

Using the above illustrations as a criterion as to what mortality may cost the poultryman, it is highly important for the flock owners to keep account of the mortality in their flock and if it is above 8 or 10 per cent. annually they should get their State poultry disease officials to determine the cause so this condition may be checked if possible. The figure of 8 or 10 per cent. was stated for we may expect that much mortality from various and non-specific causes that we cannot help.

DIET AND DISEASE IN PLANTS

By DR. J. B. S. NORTON

All the material used in plant life processes, except some gases, as taken in as solutions. If any of the necessary elements, such as potassium, nitrogen, boron, are lacking, or in too small amount, symptoms often characteristic for each element, appear. Growth is reduced especially with nitrogen deficiency. A cheesy, weak growth, with terminal bud dying occurs with lack of boro. Without iron, the young leaves are nearly white.

Infection by parasitic fungi varies with excess or deficiency of certain elements.

Dead remains of diseased plants in the field increases infection of the next crop. Rotation and compost free from diseased waste helps in control of soil borne disease.

Too strong solutions of necessary salts will prevent plants from taking in enough nutrients, or even kill the cells.

Some plants grow well only with acid soil; others do well in soils too salty or alkaline for ordinary plants.

Too much nitrogen in proportion to carbonhydrates may decrease fruit production.

These are some of the ways in which diet affects plant health.

DIET AND DISEASE IN THE DOMESTIC FOWL

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Food taken into the animal organism meets a variety of requirements. It furnishes material for the building up or repair of organs or tissues, made necessary by the processes of growth and function. A young chicken, for example, must take in material for building bone and muscle before it may come into full growth. A hen also must take into her system the material out of which she is expected to produce an egg a day for the greater part of the year. Food also furnishes material the assimilation of which generates animal energy, such energy being necessary to maintain activity of body functions and movement.

Food is a general term, including substances of widely different chemical nature, all of which are necessary to the well being of the consumer. The food substances for the building or repair of tissue are proteins, which are complex products of various amino acids. Meat products, milk and albuminous materials are specially rich in proteins. The feeling of adequate proteins in the ration is essential to the young fowl from the standpoint of skeletal and bodily growth. It is important to the hen in furnishing material to repair tissue waste, including the growth of new feathers after molting, and is also vital to the maintenance of egg production. The relation of diet to disease may be of the nature of a deficiency or a surfeit. A deficiency of protein in the ration will result in arrest of growth or repair of tissues, defective feathering, organic disfunction, and in extreme cases, weakness and death. A protein surfeit, caused by the prolonged feeding of excessive proportions of proteid substances in the ration, may be responsible for several well recognized disease conditions in poultry. The so-called crazy chick disease, which was more prevalent several years ago than at present was found to be associated with excessive protein feeding, especially in rapidly developing young fowls. Treatment, confirming the theory of causation, was simple, consisting in shifting the birds for a few days to a mixed cereal ration, comparatively low in protein, then the symptoms usually disappeared, not

to return. A form of protein surfeit more often observed in growing or mature fowls is gout. In this condition the high protein content of the ration sets up a severe strain on the kidneys, resulting in their inability to eliminate all of the urates. This material consequently remains in the system, and may accumulate in chalky or opalescent films on the viscera or in the joints and muscles. Gout, however, may also be caused by disease of the kidneys independently of a high protein diet.

The food substances intended for the production of energy are the fats and carbohydrates. Of these the latter in the form of the starchy content of most cereals are more extensively used in poultry feeding. Should a deficiency of carbohydrates in the ration occur, which is unlikely under ordinary management, it might be productive of unthriftiness, unproductiveness and emaciation. A surfeit of carbohydrates causes the storing up of excessive quantities of fatty tissue in the system. Much adipose tissue will accumulate upon the heart, viscera and in body cavity, and by reason of its bulk or weight, it may cause such mechanical difficulties as pendulous abdomen, constipation, egg-bound or ruptured yolks in the abdomen. It may also contribute to a fatty infiltration of the liver and possible rupture of that organ, due to the combined effects of weakened texture and mechanical pressure, with resulting fatal internal hemorrhage. Obesity is often accompanied by extreme plethora and may also hinder the respiratory and digestive processes.

Other substances necessary to the well-being of animals or fowls are minerals and vitamins. Several diseases of poultry may be caused by some mineral imbalance. Two in particular will be mentioned in this paper. One, which is known as slipped tendon, or hock disease, is apparently primarily caused by an excessive amount of phosphorus in the ration. This disease may appear in chicks from 3 to 7 weeks of age reared in confinement. The hock at first becomes distended from subcutaneous hemorrhage. A bending of the bones of the lower leg then occurs, which permits the Achilles tendon to slip from its grooves either inwardly or outwardly, resulting in a knock-kneed or bow-legged effect. The tendon contracts, the bending of the bones increases, causing a flexion of the leg. The bird remains permanently deformed, as no cure is possible. The spread of the condition may be prevented, or it may be checked in the early stages by a proper adjustment of the calcium and phosphorus contents of the diet, so that the former will be about 0.6 to 1.0 per cent. of the total ration, and the latter will be about half that amount. The condition may also be prevented by the addition of 5 to 10 per cent. of rice bran or 20 per cent. of wheat middlings to the diet.

The other disease due to mineral imbalance is rickets. Since the process of this disease is intimately associated with a vitamin deficiency, it will be discussed later in that connection.

The Vitamin Deficiency Diseases

The vitamin deficiency diseases, or "avitaminoses," as discussed in the

literature, are fairly clear-cut symptomatic pictures definitely attributed to the insufficiency or total lack of a particular vitamin in the ration. Probably a total lack of the vitamin rarely, if ever, occurs except under rigid experimental conditions. In natural manifestations, however, an insufficiency of more than one vitamin may exist, thus complicating the syndrome. However, for the purpose of this paper, the discussion will follow the usual classification of the vitamin, not even attempting to enter into some of the fractional subdivisions of vitamins, which seem to belong as yet in the realm of academic speculation, rather than in that of practical consideration by the leaders of a practical industry like yours.

The vitamins of importance to poultry nutrition will be discussed as follows: (1) name and description of vitamin, (2) some important sources of practical value for poultry feeding, (3) symptoms of deficiency, (4) autopsy findings indicative of deficiency.

Vitamin A is a fat-soluble vitamin, sometimes variously described as growth promoting, anti-ophthalmic and anti-infective. A wide variety of vegetable, and some fruits and animal products contain large amounts of this vitamin. The principal available sources for poultry are cod-liver oil, green feeds, including cabbage, kale and alfalfa,—also yellow corn, tomatoes, carrots, whole milk (principally of value, in this connection, for its butterfat content), and egg yolks. (Note: infertile hatchery eggs should never be utilized unless previously sterilized by cooking as a precaution against pullorum infection).

The lack of this vitamin in the ration may cause a decrease in the production and hatchability of eggs from affected hens, and may be responsible for a retardation of growth and development in young birds, accompanied by leg weakness, inappetence, and dejection. The bird may become hypersusceptible to infections involving the eyes, ears and respiratory tract. A specific form of vitamin A deficiency in chickens is known as nutritional roup. This is characterized by pus accumulation in the mouth, esophagus and infraorbital sinuses. Nutritional roup differs from ordinary roup by not possessing the characteristic offensive ordor of the latter. Otherwise it is clinically similar to that disease.

The common autopsy findings in cases of nutritional roup are the inoffensive deposits of pus on the membranes of the mouth, esophagus, eye sinuses and possibly in the upper respiratory tract.

On being supplied with feeds containing adequate amounts of vitamin A, affected fowls usually recover promptly from nutritional roup.

Vitamin B is a water-soluble vitamin, which from the standpoint of poultry nutrition, may be described as anti-neuritic. The sources of this vitamin are, principally, whole grains and seeds (i. e., those from which the germ and hull have not been removed), yeast, egg-yolk, milk, and to a lesser extent, green feeds and many vegetables and fruits.

The general symptoms which may be looked for as the result of vitamin B deficiency are loss of appetite, emaciation, lack of vigor, functional depression and leg weakness, all of which are more or less subservient to the specific polyneuritis provoked by this deficiency. Polyneuritis may be loosely defined as an inflammation or irritation of the nervous system in general. It is characterized by convulsive, or spasmodic movements of the head, neck, body or limbs. Opisthotonos, with the drawing back of the head over the median line of the body, may occur, also staggering, incoordinate efforts to walk, spreading and quivering wings, and inability to pick up feed, owing to lack of control of the nerves and muscles governing the movements of the head and neck. Polyneuritis is sometimes inaccurately referred to as St. Vitus' dance.

Fowls which have been affected with polyneuritis may show upon autopsy a marked atrophy or undevelopment of certain body organs, particularly the testicles of the male bird or the ovaries of the female. Some observers, however, have observed abnormally large suprarenal glands in such cases.

Just as in the treatment of vitamin A deficiency, so also in the deficiency of vitamin B, and in the resultant polyneuritis, recoveries follow rapidly upon the supplying of foods rich in the wanted vitamin.

Vitamin C, water-soluble, is known as the anti-scorbutic vitamin. The principal food sources of this vitamin are citrus fruits and other acid fruits and leafy vegetables. Secondary sources are numerous other vegetables and some fruits. Milk is variable, and other animal matter is devoid of vitamin C. The lack of vitamin C does not produce any important symptoms or post-mortem lesions in poultry.

Next comes the fat-soluble vitamin D, probably one of the most important vitamins and also one of the most elusive, from the standpoint of its unavailability in the common food stuffs of poultry. The leading source is cod-liver oil, "vitamin tested." Much commercial cod-liver oil, however, is poor in vitamin D, or may become improverished by age, exposure or oxidation. The presence of any appreciable amount of vitamin D in cod-liver oil which has been mixed with poultry mashes for a prolonged period is, therefore, questionable, and the feeding of cod-liver oil (not vitamin-tested) may be a mere gesture. Professor Bayon remarks in this connection that they may be many a slip twixt the oil and the chick! The oil expressed from halibut liver is in some instances also very rich in vitamin D content.

Other sources of vitamin D, less important but by no means negligible, are butterfat, egg yolks, shell fish, and certain other fish. It is also known that this vitamin can be manufactured in the skin of the living animal or fowl by irradiation with natural sun-rays or artificial ultraviolet rays, which converts ergosterol, a natural substance in the system, into vitamin

D. The vitamin then probably passes through the capillaries into the blood stream, and, like vitamin D of food origin, becomes available as a potent factor influencing the calcium and phosphorus metabolism of the organism.

A deficiency of this vitamin in the ration of birds of immature age may bring about the disease of the bones known as rickets. Without vitamin D, the system is unable to utilize the supply of phosphorus and calcium which are notwithstanding usually present in sufficient amounts in the ration to supply material for normal bone building. The result is the formation of soft, spongy bones, most likely to be betrayed in crooked legs and crooked breast bones. A serious effect of vitamin D deficiency in hens or pullets may be a marked detrimental influence on the production and hatchability of eggs, and on the calcium content of their shells.

Autopsy of fowls affected with a deficiency of this vitamin may show a general uncalcified, spongy condition of the skeleton. The breast and leg bones in particular are likely to be misshapen. In affected pullets, incomplete ovary development and distorted, inspissated ova similar to those of pullorum diseased fowls may be observed.

Vitamin E, a fat-soluble vitamin, is recognized as playing an important part in the reproductive function of mammalian animals. There is some scientific basis for the belief that a deficiency of this vitamin may under some conditions also affect chickens. The vitamin is found in physiological amounts in wheat germ oil, and in lettuce, watercress, and in various seed germ oils and whole cereals. Therefore, it is probable that under practical poultry management a deficiency of this vitamin would rarely if ever occur. Further research is needed to establish the importance of vitamin E for the poultry industry.

The last of the six vitamins to be mentioned is vitamin G, the antipellagric vitamin. That young chickens may be affected by a deficiency of vitamin G seems evident from the work of several investigators. However, Barger and Card[1] think that a more important consideration is a deficiency of this vitamin in laying hens, resulting in the low hatchability of eggs. Since the vitamin is abundantly present in dried yeast, fresh or dried milk, lean meat scrap and many vegetable greens, the inclusion of some of these substances in the diet of breeding hens should constitute adequate protection against low hatchability on this score.

Miscellaneous Nutritional Disturbances of Fowls

Other nutritional disturbances occur, which, although of little or no importance to the industry, should be mentioned in this paper.

The exclusive feeding of milk to young chicks, according to Barger and Card,[1] will produce severe anemia in 3 or 4 weeks. This can be relieved by the addition of small amounts of iron and copper salts to the ration.

A nutritional encephalomolacia, from unknown dietetic causes, was reported by Pappenheimer, et al.[2] The symptoms were ataxia, tremors, tortion of neck, convulsions of legs and stupor. Ducklings[3] receiving the same ration showed no cerebral symptoms but developed a fatal degeneration of skeletal muscles.

A dietary hemorrhagic disease of chicks is reported by Holst and Halbrook[4] and others[5] It is characterized by subcutaneous, intramuscular and intraabdominal hemorrhages, erosion of the gizzard lining and delayed coagulation of the blood of chicks. The disease is not caused by any vitamin deficiency. It can be cured by feeding fresh cabbage, and can be prevented by feeding 0.5 per cent. of dehydrated alfalfa in the diet. The basal diet on which birds developed the symptoms consisted of fish meal 20 parts by weight, dried brewer's yeast 12, polished rice 65, limestone 1, cod-liver oil 1, and salt 1.

Bayon[6] showed that a heavier mortality rate will attend coccidiosis in birds whose diet is deficient in vitamin A and low in proteids. He also showed that chronic coccidiosis tended to bring about a vitamin D depletion in birds receiving a quantity of cod-liver oil which would otherwise be sufficient to protect from rickets. Crooked breastbones and thickened joints occurred in such fowls. In pullets 4 or 5 months old numerous small and inspissated yolks were observed.

REFERENCES

1Barger, Edgar Hugh, and Card, Leslie Ellsworth. 1935. Diseases and Parasites of Poultry. 354 pp. illus. Lea & Febiger, Philadelphia.

2Pappenheimer, A. M., and Goettsch, Marianne. 1931. A cerebellar disorder in chicks, apparently of nutritional origin. Jour. Exp. Med., 53; 11-26.

3Ditto: 1934. Nutritional myopathy in ducklings. Jour. Exp. Med., 59: 35, 42.

4Holst, W. F., and Halbrook, E. R. 1933. Science, 77:354.

5Armquist, H. J., and Stokstad, E. L. R., 1935. Dietary Haemorrhagic Disease in Chicks. Nature, 136 3427: p. 31.

6Bayon, H. P. 1933. Recent advances in our knowledge of poultry diseases. Lecture III—Fowl-pox and fowl canker—coccidiosis. Vet. Rec. XIII: 39:940-947.

BREEDING AND DISEASE IN THE DOMESTICATED FOWL

By GEORGE D. QUIGLEY

I have followed with much interest the facts and implications brought to your attention concerning the effect of nutrition on plant and animal welfare. At the present time there is probably more evidence than ever that heredity and resulting resistance or susceptibility also plays a tremendous part in this condition we call disease in plants and animals. It would seem to one who has always taken an interest in the poultry disease problem, that one of the things the poultry man needs to do in the present serious situation is to look about him to observe how nature has handled the situation in the past, and then to utilize any tools nature has given him for his struggle. Since the principal step for the poultryman is the grasping of the general idea of the connection of heredity

with disease, this paper will be general in nature, not to mention the restrictions imposed by time.

In countless ages past, and down to the present, this condition we call disease has apparently been the result of the interplay of two forces—those of offense and those of defense. The offensive forces are the bacteria and the viruses which are invading the host—the defensive forces are those factors of form or plasm which enable a host to repeal the invaders. This struggle is constantly going on about us, and probably has since the beginnings of plant and animal life. The mere fact that we see plants and animals around us, including our chickens, is prima facie evidence that the present forms of life have successfully compromised the invaders, otherwise the world at present would be a world of germs and disease producing organisms.

My first experience in a controlled way, with the phenomenon of natural resistance came in the plant field. My mother was something of a rose fancier and took much comfort in caring for her modest collection. Since I was somewhat interested, I usually relieved her of the spraying and the pruning. Our roses were beset by a number of troubles, principally a spot-like disease which troubled the foliage, and many insects which either ate the foliage outright or else ruined it by skinning of the outer portion of the leaf. It required considerable protective spraying to keep these troubles under control. Then came one of the early Van Fleet roses, developed by the late Dr. Van Fleet, having a very different type of foliage. The new variety had a heavy, dense, shiny, leathery foliage in comparison with the older varieties. It did not require long to see that this new variety was much more resistant to the disease mentioned and in addition seemed much less palatable to insects. As a matter of fact, to my knowledge this original plant has never been sufficiently bothered by disease or insects to warrant any spraying whatsoever. Here is an example where a change in form or structure makes the rose more resistant to the enemies which are manifestly around it. The enemy is there, probably just as strong as ever, but this Van Fleet rose in our climate and soil is better able to repel the enemy. In this case, as in other instances in the plant world, it is comparatively easy to see this thing we call resistance and to attempt to develop a theory to account for its presence.

Similarly, we find that in the plant world many other examples of specific resistance to disease is to be found. Some of these have been developed exclusively by nature, and in the others, we find that man has aided and accelerated the process. Perhaps of as much interest and importance to Maryland farmers is the fact that disease resistant strains of tomatoes, peas, cabbage and sweet corn have been developed. In these instances the man of science has literally gone into the disease field and has found those few specimens which are strong and healthy in spite

of the general victory for disease all about them. The scientist has preserved and developed these healthy specimens and thus has enabled growers of these crops to carry on successfully.

The Maryland Agricultural Experiment Station has taken an active part in this work of building up resistance to disease in plants, and has produced strains of tomatoes and peas resistant to disease. One of the pioneers in this work was Dr. Norton, and it was pleasurable last summer to hear Mr. Rieck's tribute to the Norton tomato successfully developed many years ago to combat certain disease which was destructive to the tomato plantings in Maryland.

In the development of these disease resistant plants, man has proceeded on the same road as nature, and has apparently only accelerated the effects of that well-known principle of the survival of the fittest. He has, by selecting for reproduction the strong and resistant, and totally rejecting the weak, accomplished in a few generations what nature would have accomplished probably only in many generations.

When we leave the plant world and consider the diseases of man and the lower animals, we similarly find abundant evidence that this same process of selection of the resistant and the rejection of the susceptible has been going on. By this simple law, nature has produced certain races of men and lower animals which are inherently resistant to the common diseases. Classical examples are the racial resistance of the Jew to tuberculosis, the Negro to the blood parasite malaria, the Oriental to yellow fever, and the comparative resistance of the white man to measles in comparison to the serious susceptibility of the American Indian to this disease. In each case an unfettered nature has apparently followed this same highly effective formula of the rejection of the weak and the propagation of the strong.

In the field of lower animal biology, we can observe many of the effects of the same process. The Zebu breed of cattle, which is a tropical animal is very resistant to the essential tropical Texas fever, foot-and-mouth disease, and splevic fever. This resistance, acquired through natural selection is inherited and is transmitted to its offspring. In his paper dealing with a similar subject which was read before the past summer meeting of the Maryland Poultry Council, Professor Waite pointed out many interesting results of the same force, natural selection in animals. The conclusion seems quite inescapable that nature has in the past, and is now, building in man and in domestic animals a type of inherited resistance to the common enemy of that species.

Let us leave the field of completely natural selection and see what man has accomplished in the field of experimental animal biology. Here we find that truly remarkable results have been achieved, sufficient to indicate that here also, as in the plant industry, man may considerably

accelerate the work of nature. Progress has been remarkably rapid considering the small amount of work which has been performed on this problem, and in view of the difficulties confronted. Perhaps one of the most interesting and noteworthy pieces of work has been performed by the Rockefeller Institute working with mice as the experimental animals. There it was demonstrated that by the simple process of selection that both resistance and susceptibility to the germ bacillus enteritidus could be developed, and that the desirable resistance they were able to isolate was inherited by the offspring from parents. Mice were also used by Dr. Tyzzer who conducted experiments on the resistance of these animals to certain types of tumors. He reported that certain strains of mice are inherently resistant to specific tumors and that they can transmit this resistance to their offspring.

There has also been developed in the field of poultry husbandry a splendid body of evidence pointing to the fact that nature is prepared to materially aid us if we will adjust our thinking and our practices to conform with her wishes. This in the main must consist of essentially the same program followed by nature in the development of disease resistant races of men, lower animals and plants, and by the modern plant breeder who has developed disease resistant strains of cultivated plants. Its fundamental must always consist of the total rejection of the weak and the retention of those which in the presence of infection have demonstrated that they are strong.

We as poultrymen can see evidence supporting this view all about us. Perhaps the best place to look is in that place where chickens from many sources are brought together for many months of uniform care and attention—the egg-laying contest. The interesting thing observed here is that the birds of certain breeders will consistently show high mortality, while others, perhaps located in the next pen, will show little or no mortality. In fact, I believe that one of the major lessons I learned from the Maryland Egg Laying Contest was the fact that the birds of certain breeders would consistently, year after year, regardless of what pen they were in, show little or no mortality. These pens seemed inherently able to cope with what disease they came in contact with.

A commendable nucleus of information has been built up by certain investigators in the poultry field, pointing out that hereditary resistance to many of our specific poultry diseases may be built up by selection. The work of Frateur, a Belgian, working with Avian diphtheria or pox, Doctors Lambert and Knox working with fowl typhoid and Doctors Roberts and Card with Pullorum disease (B.W.D.) and Biely and associates working with range paralysis, have demonstrated that resistance to these diseases respectively is transmitted to offspring, and may be built up by selection.

You have been advised on a number of occasions by papers read by

Professor Waite of our own experience along the lines of that most cussed and discussed disease—Pullorum. Our experiment which has been in operation for a number of years, was originally designed to test the efficiency under the most severe handicaps we could conceive, of the program based on selection of the fit and rejection of the weak as advocated in Maryland Bulletin No. 274. You have been advised that it early became evident that we were dealing with hereditary factors when certain families possessing superior resistance appeared. The success of this method of approach is best indicated by the fact that our greatest problem has been caused by the tendency toward rapid disappearance of the disease from the flock, which of course would remove the constant flock exposure in incubator, brooder and laying house we desire. I wish to point out that in our own work, as in these other poultry investigations quoted, that we have primarily practiced what seems to have been the same basic formula followed by nature and man in the development of hereditary resistance in plants and animals. Again stated, this consists of total rejection of the unfit, and the retention and breeding of the fit, and the practical poultryman must understand this fundamental philosophy before he can hope to progress farther along these lines.

The practical poultryman, in looking over the evidence pointing to the existence of a hereditary resistance to disease, may feel somewhat confused as to a program to follow. It is not my contention that he should attempt to select first for resistance to diphtheria, then typhoid, then Pullorum disease, and so on. This is for the scientist whose duty it is to point the way.

Furthermore, unless the poultryman firmly grasps the idea or philosophy of this whole approach, he could not follow a program no matter how well outlined. But until science has had further opportunity to explore the road ahead for the poultryman, he can feel that he is surely on his way if he will adjust himself with that much of the road nature has already revealed to him.

HISTORY OF DISEASES IN THE DOMESTIC FOWL

By ROB H. WAITE
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At the outset of this address I want to make it plain that this subject was selected for me by the committee on program, and that I lay claim to no special talent for historical criticism. It is an exceedingly ambitious undertaking, to attempt to write the history of disease in the Domestic Fowl. I hope that each of my listeners will appreciate the degree of humility with which I undertake the task. I feel that it is very much of a compliment to be invited to prepare a paper on a sub-

ject having the breadth and requiring the understanding that this one does, and my fervent hope is that I may, at least in a partial way, measure up to the confidence in my ability that was indicated when the subject was assigned.

History, I mean genuine understanding history, is all important and fundamental to our very civilization itself. An understanding of history is the very basis and foundation of civilization. Civilization is based on past experiences. It is, therefore, a basic fact that the better we understand the past, the better we can plan the future. An undersanding of the past is the understanding of history. I am almost constrained to say that history is civilization.

The practical man, the man who is providing the essentials of living, is likely to scoff at history. He is usually totally unconscious of the part played by history in the development of the very tools and ideas which he applies so successfully. Youth particularly, takes things as it finds them, with very little concern or appreciation for the past experience that are the very foundation of his existence. The boy laughs at the ideas of the "old man." He is not hampered by understanding. He goes happily on his way until he finally crashes into formidable obstacles. Then, if he is made of real "stuff," he begins to learn history, even though it is very recent from his standpoint.

I think history is likely to be undervalued in a dashing young nation, such as ours. Things that satisfy human desire are so easily obtained that little value is put on a study of experiences. When the shoe begins to pinch the whole situation takes on a different aspect. I am inclined to the opinion that there is a little tightening up on the shoe in our own country at the present time.

After these preliminary remarks I will attempt to get a little closer to my subject, the history of disease in the domestic fowl. I doubt that anyone would expect me to present a real history of disease. To do this would require some superhuman gift, for disease has no doubt progressed through the ages, even long before man was capable of taking note of it. It seems to me that all that I can be expected to do is to point out a brief portion of the history of man's conception and understanding of disease. It is a familiar habit with man to date the occurrence or beginning of disease to the time when he first recognized it as such. As a matter of fact, man and poultry and all the other multitudinous forms of life must have survived uncountable and unestimable attacks by disease throughout the ages that life has been present on the earth. To give a true history of poultry disease would be to recount all the strife and battle that has gone on during the thousands of years that our poultry has been in the process of development. Obviously this is not possible and the nearest one can come to presenting a history of disease is to write of man's knowledge of disease.

The earliest writing that I have on poultry disease is by Varro, who lived between the years 116 B. C., and 27 B. C. and which was translated by Owen in 1800. Thus the information that you are about to hear on the subject of disease in poultry was written approximately 2000 years ago. Says Varro:

"You must put straw in the nests, when they lay; When they hatch, you must remove the straw, and put in some that is fresh, because fleas and other things are usually bred, which do not suffer the hens to rest, on which account the eggs are either hatched unequally, or they get addled."

Apparently they had external parasites, possibly red mites, even in those early days.

Varro continues:

"When they begin to have feathers in the tail, the vermin is to be often taken from their heads and necks, for they often decay on account of them. You must burn hartshorn around their coops, that no serpent may make its approach, which animals are usually pernicious to them. They are to be driven to the sun and to the dunghill, that they may roll, because they thrive better by this; not only the chickens but all poultry, when the weather is favorable and warm; a net being spread over them, which may prohibit them from flying without the bounds, and to preclude the hawks or any other animal of prey from attacking them. They are to avoid heat and cold, each of which is adverse to them."

Even Varro recognized the value of sunlight. At that time chicks had head lice, were the prey of hawks and were sensitive to extremes of heat and cold.

The next reference that I will call to your attention is by Moubray in 1830. I might say here that I make no attempt at completeness. The time at my disposal has not allowed of search outside my own private library of old books on poultry.

Moubray said in 1830, "The diseases of our domestic animals kept for food, are generally the result of some error in diet or management, and should either have been prevented or are to be cured most rapidly and advantageously by an immediate change, and adoption of the proper regimen. When that will not succeed, any farther risk is extremely questionable; and particularly with respect to poultry, little hope can be derived from medical attempts."

The diseases mentioned by Moubray are, pip, roup (an abscess of the rump). Of roup he says "roup also seems a general term for all diseases, but is chiefly applied to catarrh, to which gallinaceous fowls are much subject." Other diseases mentioned are "The Flux and its opposite, Con-

stipation," Vermin and Gapes which he speaks of as a new disease. Also listen closely to this: "Chickens are frequently, and chiefly in bad weather, seized with the chip, in about three weeks from their hatching, when all their beauty of plumage vanishes, and they put on their long great coat, or rather shroud, and sit chipping, pining, and dying in corners; always apparently in torture, from a sense of cold, although to the touch they seem in a high state of fever. This disease seldom admits of remedy; . . . .. The sun, or warmth in the house, by the fire-side, are the best remedies. The fire is a great restorative of all young, indeed of all animals". Could they have had coccidiosis in 1830 and can we believe that any one knew so much about the treatment—"warmth . . . by the fireside."

Moubray also describes an operation for crop impaction, the trimming of a Cock's spurs, and treatment of head parts after fighting.

The next reference is "Ferguson on Fowl" written in 1854. Ferguson writes of apoplexy and recommends application of leeches or blood letting, mentions paralysis which he intimates is only a variation in an attack of apoplexy, and vertigo or giddiness. All three conditions are to be treated by bleeding.

Under "Diseases of the lungs and air passages" he lists catarrh, bronchitis, roup, gapes, pip (I have always wanted to know what pip is), consumption or phthisis, and asthma. For most of these diseases Ferguson recommends "removal to a dry, warm situation." For some of them he recommends such drugs as calomel, bi-chloride, iron sulphate, etc. For consumption (tuberculosis) he says . . . . . at an early period of the disease cod-liver oil may be used with advantage." This would not be considered bad treatment even at the present time.

In "Diseases of the digestive organs," Ferguson mentions distended crop, gastritis or inflamation of the stomach, diarrhoea, dysentery, and constipation. Castor oil and correction of the diet are the principal remedies recommended.

He also describes "diseases of the skin," white speckled comb (perhaps favus), inflammation of the rump gland, corns (probably bumblefoot, vermin, moulting), and "the hatching fever." Inflammation of the rump gland, mentioned by a number of early writers is apparently a disease that has run its course, or for which the present races have developed an immunity, for it has not been a common disease in my time. For vermin Ferguson recommends "a good supply of fine dry sand and ashes to roll in . . . ," or "flour of sulphur, applied between the feathers."

"Diseases of the limbs" are listed, among which is rheumatism, and gout (swelling of the joints of the feet). He mentions "cankered mouth" in connection with fighting game cocks.

Lewis Wright in his comprehensive "Book of Poultry," written about

1870 devoted 21 pages to disease, the total number of pages in the book being 591. I would like to quote here a paragraph from Wright:

"There can be no doubt whatever that a certain percentage of death amongst fowls is an actual benefit. Fowls, like everything else, *must die sometime*, and, again like everything else, it can but seldom happen that the cause of death will be mere old age. A certain proportion of loss, therefore, is not necessarily a proof of mismanagement, but is rather part of the economy of the great Superintendent of the Universe, by which creatures no longer really capable of maintaining the vigor of the species are taken from a world in which they are of no further use. As is well put by a writer in one of the American poultry journals, "the sure eye of Nature has picked out the very ones that you would be glad to be rid of could you detect them, and has left you the hardier individuals to breed from; the weakness, moreover, often consisting in some profound fault that does not show itself."

It is my humble opinion that the modern poultry breeders can well afford to spend considerable time studying over this pregnant paragraph written by the brilliant student of poultry culture more than sixty years ago. "Part of the economy . . . . , by which creatures no longer really capable of matniaining the vigor of the species are taken from a world in which they are of no further use."

New diseases not mentioned by the previous authors quoted, but described by Wright are: cholera, elephantiasis (scaly legs), and liver disease. Wright says of cholera "During the last few years American yards especially have been devastated by a disease previously unknown, to which the name of chicken cholera has been generally given; and of late many cases have occurred in England." He also says, "We never heard of a case of true cholera where cool shade was always accessible, fresh cool water provided, and green food looked after daily."

The earliest book exclusively devoted to poultry disease that I am familiar with is a rather voluminous volume entitled, "Diseases and Enemies of Poultry" by Pearson and Warren. This was published by the Department of Agriculture of the State of Pennsylvania in 1897.

"Diseases of Poultry", by D. E. Salmon was written in 1899. Salmon's work is largely an elaboration of the general information given by the earlier authors. Aspergilloisis, a lung disease caused by a parasitic fungi, is described. Other new ailments treated are air-sac mite, bacterial enteritis, going light, psorospermic enteritis (coccidiosis), black head in turkeys, quite a long treatise on worms, vent gleet, a quite extended discussion of lice and mites, and favus.

Salmon, being a Doctor of Veterinary Medicine, brought the veterinarian point of view into the poultry field. To illustrate I will quote from

his treatment for the disease now termed coccidiosis, "The chief reliance in combating this disease should be placed in the efforts to eradicate the contagion. If disinfection and change of ground are not successful, dispose of all fowls for a time, plough up the ground, clean up thoroughly and start with new stock, preferably incubator chickens, from healthy flocks." No mention is made of the influence of feeding and management in the control of the disease, and the whole work of Salmon is notable for its scant recognition of the important part nutrition and management play in the prevention and cure of disease.

The "Farm Poultry Doctor" by N. W. Sanborn was published around the turn of the century. Pearl, Surface and Curtis published a rather extensive bulletin from the Maine Experiment Station on "Poultry Diseases and Their Treatment" in 1911. Later in 1915 this was extended into "Diseases of Poultry" a 342-page book which was the standard work on poultry disease for a number of years.

John H. Robinson published his book on diseases "The Common Sense Poultry Doctor" in 1913. Robinson had a well balanced viewpoint for his time, and was a thorough student of poultry culture, but his writing style was wordy and his book on disease had little influence.

In 1922 Ward & Gallagher published their text on "Diseases of Domesticated Birds," and the latest text "Diseases and Parasites of Poultry" is by Barger and Card, published in 1935.

This very sketchily brings us up to date on the history of disease as found in general treatise on poultry and poultry disease. It may be well to consider a few of the common ailments and attempt to trace man's knowledge and understanding of them.

The poultry louse was apparently the first organism that man observed as interfering with his poultry in their normal process of living. Lice are big enough to see with the naked eye. Even as late as my first observations on handling of poultry, it was common to ascribe almost any illness among chickens to lice. All one had to do was to look among the feathers and the lice were there, the chickens were ill, therefore lice were the cause of the illness. At that time commercial louse powders were very popular. "Death to Lice," a brand compounded mostly from tobacco dust, by Dan Lambert who is still living in Rhode Island, was one of the earliest and most widely known. A dusting machine was put on the market about 1906. Perhaps this was the beginning of the machine age in poultry. You put powder into a fairly large canvass cylinder suspended, horizontally, on two end supports—then about a half dozen hens were added. Next you pulled the draw cord, gave the handle about a dozen turns, then removed the hens, somewhat dizzy and groggy and out of breadth, it is true, but also what was thought most important, free from lice.

Lawry of Cornell about this time devised a louse powder made principally of a mixture of plaster of Paris and crude carbolic acid. This was a home mix and popular for a time, but was rather rough on the birds, especially young chicks, and it lost popularity after a strong preliminary run. Dipping in sheep dip solutions to control lice was popular for a time. In 1917 Bishop and Wood of the U. S. Department of Agriculture found that Sodium Flouride was an excellent louse powder, and this material was justly popular for a time. About 1929 Black Leaf Forty was found to be effective when applied to roosts, and now you have poultry lice up to date.

Gapes were early recognized, comparatively speaking. Gapes are caused by a forked worm, a very peculiar worm, the only worm of its type known to exist. Both male and female are attached, and the worm has two heads, one male, the other female, and both are attached to the breathing tubes of the chick. Gape worms clog the breathing tubes and cause gasping for breath. These worms (the female section) are commonly an inch in length, are very red, and easily recognized by the naked eye when the trachea is opened. This probably accounts for their early discovery. The disease was first mentioned in the literature by a Marylander, Dr. Wiesenthol of the Baltimore Medical College who wrote of it in 1797. Megnin of France in 1880 prepared a rather elaborate "memoir" on gapes and with it won a substantial prize offered for scientific work. Megnin traced the life history and claimed to have established the fact that the disease could be communicated from bird to bird without the assistance of any other animal. This work was early translated by Smith of the U. S. Department of Agriculture in 1884.

Walker, a Medical Doctor in New York State, studied gapes and found (1886) that earthworms were an important factor in spreading gapes. Garman at the Kentucky Experiment Station, in 1897, reported tests that confirmed Walker's theories. Still the public would not believe. In 1917, I tackled the problem, publishing in 1920. My results fully substantiated Walker's theory that earthworms were the important factor in transmitting the disease. And still the poultry experts will not agree. During the past few years considerable work has been reported from England where they also find earthworms are the important factor. Perhaps sometime we will be able to get the facts accepted. In the meantime, the disease is not common on commercial plants, but we do have a few cases reported from farm and back yard flocks each year. Treatment of affected birds is unsatisfactory. It is important that chicks be kept from earthworms living in infected soil.

Intestinal worms are fairly easy to see when the bird is properly opened, and worms were early studied. The early students of anatomy found the study of worms interesting. They did a rather complete job of working up life histories, so that Salmon in his book published in 1899

lists twenty-five species of tapeworms as affecting various forms of poultry. "Worming" was popular in the human not so many years ago, so it is not strange that much emphasis was put on worms by the early students of poultry disease. Worms are still a very fashionable disease among poultrymen, and it is a very easy disease to demonstrate at autopsy. Almost any hen, even a healthy one, will accommodate by showing at least a few worms.

Fowl cholera is mentioned in some of the oldest works treating of the diseases of animals. It was studied in 1787 by Chabert who regarded it as a form of anthrax. Fowl cholera was one of the bacterial organisms selected for study by Pasteur in 1880. Pasteur worked with this disease in perfecting and devising his system of vaccination. He found that birds could be immunized against the disease by inoculations of attenuated cultures of the disease germs themselves. Cholera was the "leading" poultry ailment for a time and poultry raisers lived in constant dread of it. An outbreak was expected to wipe out every individual in a flock. Owners were advised to get rid of all their stock when once the disease took hold. I doubt if any more successful way could have been devised to keep the disease active and virulant. The survivors of an attack were destroyed and not kept for breeding purposes. In late years poultrymen pay little attention to cholera and it seems to have pretty much disappeared. It is said to be responsible for some of the oviduct trouble of the present generation of fowls, but it is likely that strains will soon develop with resistance even to this subtle form.

Leg weakness among chickens reared inside was long a problem of poultry raisers. Many and varied causes were ascribed to this disease. In 1906 bottom heat was thought to be the cause. In nature the hen provided heat at the top, the artificial brooders of the day for the most part, were heated from the bottom, so what was more natural than to conclude that bottom heat brought on the trouble. Much work was done at the Rhode Island Experiment Station in the years 1908 to 1910 in an attempt to solve the difficulty. Soil was put on the brooding floor, many systems for furnishing heat were tried, many types of litter were used, and still the losses continued. It seemed at the time that some magic properties were contributed by contact with the natural soil. Chickens would grow and develop when ranged outside, but with conditions exactly the same, they would get leg weakness when raised in confinement. I helped with the work at R. I. and developed the theory that the probable cause was a lack of natural sunlight. This was the incentive that brought about the Maryland Colony Brooder, with large and sliding windows, in 1912. Previously small windows were used because of the tendency for chicks to collect in sun spots and crowd. Shortly thereafter workers at the Wisconsin Experiment Station brought fourth scientific evidence that ordinary window glass filters out the beneficial rays from sunlight, and demonstrated that these rays are necessary to prevent leg weakness or rickets.

About the same time it was shown that cod-liver-oil, which contained vitamin D, would, when fed in relatively small amounts, prevent the development of the disease.

The importance of minerals in the ration of both chickens and hens was stressed about 1915. Not much attention had previously been given to minerals in the ration for chickens. Minerals had previously been considered much as an adultrant. But the tide turned with the attention focused on the importance of minerals, until now the tendency is to use too much mineral. Slipped tendons, (Perosis) appears to be one of the troubles brought on by this excess.

Blackhead in turkeys has been a serious problem for poultrymen since about 1893. First attempts to control Blackhead was by crossing with wild turkeys, as recorded by Cushman of Rhode Island in 1893.

Theobald Smith of the U. S. Bureau of Animal Industry in 1895 ascribed the disease to a protozoan organism, an amoeba.

Cooper Curtice of Rhode Island in 1907 demonstrated that "the disease (blackhead) was not transmitted through the egg, but in some way from the soil or from forms of animal life met therein or thereon." "The experiments show that turkeys should be reared away from the house, and that they should be kept from all fields where ordinary fowl are likely to forage." That appears surprisingly modern yet it was written by Curtice almost thirty years ago.

In 1913 Hadley, from the same Experiment Station (Rhode Island) discovered that Blackhead could be avoided by feeding relatively large quantities of sour milk and chopped green feed, with a limited amount of material from a grain source.

In recent years (about 1928) Smith and Graybill have demonstrated that the eggs of the caeca worms of fowls carry the infecting organism of Blackhead.

The present method of avoiding Blackhead is to keep the turkeys away from ordinary fowl, feed large proportions of animal feed especially in milk products, feed an abundance of such vitamins as are found in green feed and in cod liver oil. The many drugs that have been recommended at times to control and cure the disease have all been abandoned. Practically the whole dependence is placed on management.

Bacillary White diarrhea (now called pullorum disease) has held the stage in the poultry world for a long time. The organism that causes the disease was discovered by Rettger in 1899. About 1907 C. K. Graham at the Connecticut Agricultural College encountered much trouble with a young chick disease. When Stoneburn took charge of the work of the Poultry Department at Connecticut in 1909 he encountered so much dif-

ficulty with young chick mortality that he consulted Dr. Rettger who had moved from the midwest and was handy by at Yale University. In 1909 Rettger and Stoneburn reported that the infection causing what poultrymen called white diarrhea was transmitted by the mother hen and that the infective organism was Bacterium Pullorum. They named the disease Bacillary White diarrhea, a name retained until fairly recent years when it was renamed pullorum disease.

Rettger early perfected a method for detecting the carrier hen by trapnesting and obtaining a number of eggs from each hen. Laboratory cultures were made from these eggs to determine if the bacterium was present. When found, the hen that laid the eggs was discarded. The method served a very useful purpose for experimental work, but was too involved to be practical in application in the commercial field.

Jones of Cornell in 1909 applied the Agglutination test, commonly used in diagnosing human typhoid cases, to the detection of the carrier hens. This test was later perfected and refined and is the one commonly used in blood testing work at the present time.

In 1917 Ward and Gallagher developed the wattle test, a test quite similar to the one now used in testing for tuberculosis in cattle. This test is simple in application, as the results are readily apparent without recourse to laboratory tests, but for some reason the test never has been popular.

About 1920, Bunyea and co-workers of the U. S. Department of Agriculture developed an agglutination test by using whole blood smeared on a piece of glass with special antigen solution applied. This very much simplified the testing, so much so that an intelligent poultryman can make his own test. Equipment for making the test, and the antigen, is sold by a number of commercial laboratories catering to poultry raisers.

In 1925, bulletin No. 274, written by myself, was published at the Maryland Experiment Station. The following is quoted from the bulletin, "Our experience at the Poultry Plant of the Maryland Experiment Station leads us to believe that the disease (Bacillary White diarrhea) can be prevented, controlled and eliminated from a flock by a simple, continuous method of attack and control, all the practices of which are good general management in themselves." The essential feature of this management method of control is the destruction of the sick chicks during their first few weeks in the brooding pen.

In April, 1911 Rettger said ,'Since infected chicks make unsatisfactory development for the first few weeks, and may later regain vigor and make fair growth, it is advisable to select at an early age those intended for breeding purposes." Rettger would have had to take but a single short step to recommend destroying the infected chicks. It has always been a deep puzzle to me why poultrymen are so loath to get rid of the weak,

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sickly chicks which are so likely to develop into disease carriers, if they finally grow up.

Recent investigations have shown strong indications that resistance to the pullorum disease is inherited, and the breeding of resistant strains seems the more likely road to permanent control. There is strong probability that our present method for testing, which involves the elimination of birds that have demonstrated their ability to withstand the disease, is a step in the wrong direction, unless perchance we wish for some reason to keep our strains in a susceptible condition.

There are many complicating factors when one considers methods for eliminating this disease. One is that blood testing has come to have commercial value. The public demands blood-tested chicks, even when they do not have the least idea what blood testing is supposed to accomplish. Many customers think that blood-testing eliminates the chance for any disease to develop. Then there is the question of employment of the vast force of laboratory workers who are engaged in making the actual test. Were the disease to suddenly drop out of existence it might complicate improvement programs very materially.

One other observation concerning bacillary white diarrhea, I should like to make. It has been my observation that the disease is most severe in newly formed breeds. It was severe in the Orpingtons which were boomed about 1907. It hit the Rhode Island Reds hard around 1910 to 1915. It is not usually much of a factor in the Leghorn, probably because this breed is raised in such large numbers that more rigid culling is practiced. The disease is also quite often encountered in the second generation of crosses made to combine strains. This phenomenon is not difficult to explain on the basis of Mendelian inheritance.

Coccidiosis has long been known but it has been only recently that poultrymen have been able to pronounce the name and consequently the popularity of this disease is comparatively recent. As I have previously mentioned, Maubray apparently described the disease in 1830. Salmon treats of it in his book written in 1899. Coe and Hadley did a lot of work with it in 1918-19 at the Rhode Island Station. During the extreme popularity of bacillary white diarrhea, coccidiosis had to take a back seat, but has rapidly come to the front in recent years. For myself I early learned to control the disease, having had experience with it while working with Hadley in 1909-10. Drugs were early used in attempts to control the disease. These were not found efficacious. The California Station recommended the use of 40 per cent. milk in the mash, flushing it is now called. Beach and Card in 1925 found that spores of coccidiosis in fresh droppings will not produce the disease. The organism must go through a development called sporulation before becoming infectious.

Johnson of Oregon found that chickens build up an immunity when

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subjected to the disease organisms in moderate doses. Our own Mr. Truslow of Chestertown was on the right track a few years ago, in my estimation, when he recommended a starvation cure. Birds fed intermittently, and otherwise wisely handled, rarely contract the disease. Getting the birds on the ground early develops a gradual immunity that prevents outbreaks of the disease. Keeping chicks properly warmed has a lot to do with preventing the disease. Extreme saturation is of doubtful value in coccidiosis. Keeping the droppings dry is more important than sanitation, in my estimation.

This paper is already too long. I will bring it to a close with a few random notes.

Disinfectants were going strong when I first became interested in poultry as a student in 1906. Zenoleum had recently been introduced.

Condition powders were very popular in the "gay nineties". Here is a typical list of ingredients of a condition powder. Linseed meal, wheat feed, cayenne, charcoal, salt, Epsom salts, iron oxide, sulphur.

Beach found one form of roup, nutritional roup, resulted from a lack of vitamin A in the ration.

Cannibalism is a current problem and is probably almost entirely nutritional. Sometimes it is lack of mineral, at other times I think perhaps it is due to too much mineral. It is difficult to cure, hence the principal emphasis must be placed on prevention.

Chicken pox was a young chick disease as late as 1910, to my personal knowledge.

Mrs. Tancred looked after the brooding on the Tancred farm. In a description of her methods, reported in Reliable Poultry Journal a few years ago, she emphasized the importance of culling out the weak chicks and destroying them. Each morning she made it a practice to pick up the weak ones, before feeding, for after feeding it is not so easy to find them, and as she had too much sympathy for the little ones, to pinch their necks, she chloriformed them. When first the Tancred flock was tested for Pullorum disease, not one reactor was found.

REPORT

OF THE

Boys' and Girls' 4-H Club Leaders' Conference

January 15, 1936

Baltimore, Maryland

State and County Extension Agents, Local 4-H Club leaders and young adults active in 4-H Club work composed a group of over 100 in the 4-H Club section of the Farm Bureau Convention at Baltimore, January 15, which discussed rural youth problems.

Discussion of two main questions, led by Miss Dorothy Emerson, Girls' Club Agent, was summed up by Miss V. M. Keller, State Home Demonstration Agent, as follows:

I. What are the deep-rooted needs of youth and are we, through the 4-H program, satisfying these needs?

1. Understanding of adults is the crying need of young people.
2. Publicity, entertainment and recreation all are needed for young people.
3. How to face life's problems.
4. An increased interest in project work.
5. Sharing together opportunities and responsibilities.
6. Need for guidance and companionship.
7. Need to carry out projects to completion.

II. What decision-making experiences are the club members of your community having?

1. Discussions by club members.
2. Choosing one's life work.
3. Joy from decisions, responsibilities, cooperation and understanding.

In the second part of the program, led by E. G. Jenkins, State Boys' Club Agent, delegates from County Councils in Allegany, Carroll, Frederick, Harford, Howard, Montgomery, Prince George's, and Washington Counties stated the plans of the young adult groups for 1936.

Reports of the Student Section meetings of the American Country Life Association Conference, Columbus, Ohio, were made by Miss Mary Rohrer, Washington County; Miss Ida Stiles, Montgomery County; and Mr. Jenkins.

The meeting closed with a challenge to older youth from Mr. Jenkins to undertake some worthwhile community work program in 1936; a challenge which Dr. T. B. Symons has continually offered to rural young adults of Maryland.

MINUTES

OF THE

THIRD ANNUAL MEETING

OF THE

Maryland Farm Roadside Market Association

Lord Baltimore Hotel

January 16, 1936

Baltimore, Maryland

The meeting was called to order by President A. H. Nofsinger at 10.30 A. M. Nineteen persons were in attendance. The minutes of the last meeting were read and approved.

President Nofsinger mentioned some of the activities of the association during the year. As a result of a conference with the official in charge of the Market News Service in Baltimore, a change has been made in broadcasts and news letters making it clear to the public that such prices are wholesale and not retail.

It was explained also that at a meeting held in the summer of 1935 it was decided to discontinue the lease of the large sign at a price of $10 per year. Anyone desiring to display one of these signs may secure it at cost. Those having signs in their possession may keep and use them as long as they are in fit condition.

A large card, identifying the markets of members, was exhibited and it was explained that these cards are to be furnished to all members upon payment of their dues. Thus, the entire cost of becoming a member is $1 per year. This does not include the cost of quality labels, etc., which are furnished by the State Department of Markets at cost.

Three resolutions were presented and unanimously adopted after thorough discussion. These resolutions dealt with the following matters: (1) Asking that a special tax be levied upon operators of trucks selling various kinds of farm produce on the highways of the State other than that produced by themselves; (2) Advocating repeal of the gross receipts tax; (3) Asking for the rigid enforcement of the Maryland fresh egg law.

S. Elmer Parks, secretary of the Baltimore County Retail Dealers' Association, was present and presented three resolutions similar to those mentioned above which had been passed by that organization.

At this time the secretary called for payment of dues and extended an invitation to new members to join the association. Three new members were enrolled.

S. L. Deitz suggested that more publicity be given to roadside markets. S. B. Shaw, chief, Maryland State Department of Markets, stated at this point that several States issue a market bulletin at stated intervals, in which are listed under the headings "For Sale", "Wanted", and "For Exchange", various commodities and articles which farmers have to dispose of or desire to purchase. There is no charge for insertion of such items and the publication could be distributed without cost to those advertising therein. The bulletin would contain no commercial or paid advertising. Mr. Shaw also stated that the Roadside Market Association could have a definite space with suitable heading, in which the advertisements of members could be inserted.

A motion was made by Mr. Emge and duly seconded asking the secretary to convey to Mr. Shaw the desire of this association that such a publication be started as early as possible.

Attention was called to the fact that the University of Maryland Extension Service each year is allotted space at Timonium Fair for making an exhibit, and since for the past several years it has been the practice of the Extension Service to concentrate upon some particular agricultural industry, the secretary was instructed to request the Director of Extension to devote the space this year to a roadside marketing exhibit.

The following officers were re-elected for 1936.

A. H. Nofsinger, president;
Fred L. Emge, vice-president;
E. P. Walls, secretary-treasurer.

In addition to these officers the following were elected as members of the executive committee:

J. A. Wade Thomas,
S. L. Deitz.

There being no further business, the meeting adjourned at 12.30 P. M.

E. P. WALLS, *Secretary-Treasurer.*

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